GSDIVA:
GS Dog Inherited Ventricular Arrhythmias

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√ALBA MEDICAL

What exactly is GSDIVA?

How is it diagnosed?

What constitutes a normal test?

What are the optimal ages for performing the Holter monitor?

Signs and symptoms to watch for in the dog?

Will the pup outgrow the condition?

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What exactly is GSDIVA?

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German Shepherd Dog Inherited Ventricular Arrhythmias

or
IVAGS
Inherited Ventricular Arrhythmias of German Shepherd

Other breeds?

What exactly is GSDIVA?
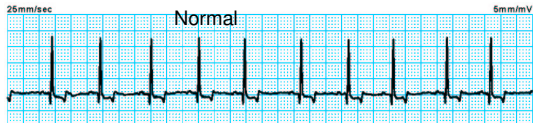
Ventricular Arrhythmias

IVAGS
Ventricular Arrhythmias
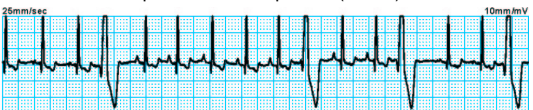

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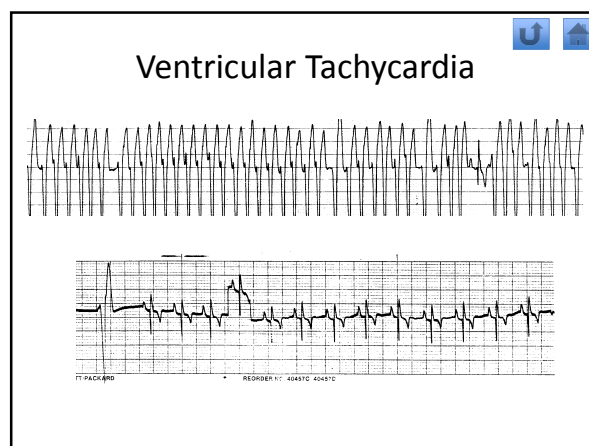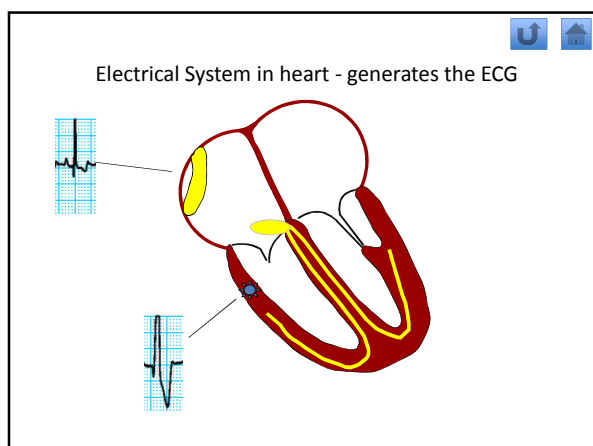Ventricular Arrhythmia

- ventricular extra or premature beats
- Can be individual beats, pairs, triplets or runs of ventricular beats called salvos (short bursts) or sustained runs called ventricular tachycardia

25mm/sec   Normal   5mm/mV

Ventricular premature complexes (VPCs)

25mm/sec   10mm/mV

Electrical System in heart - generates the ECG

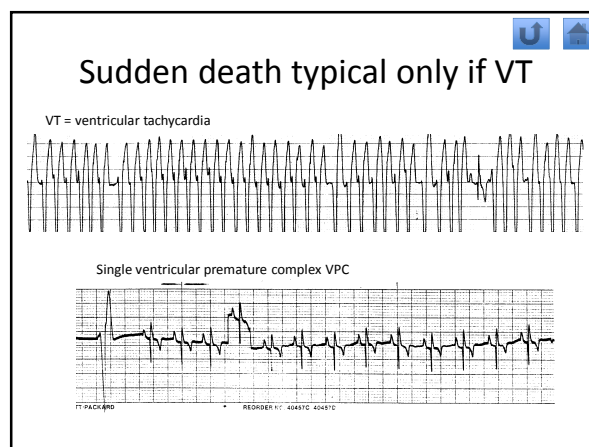
Ventricular Tachycardia

What exactly is GSDIVA?

What does that mean for the dog?

- Sudden death typically occurs only in dogs with Ventricular Tachycardia
  - >10 runs @ >350 bpm = 50% sudden death
  - Dogs most commonly die suddenly at 7 months of age

- No other clinical abnormalities are present. Arrhythmia is the only one.
  - Dogs that die typically do not have structural changes

- Arrhythmia due to change at cellular level with ion channels related to repolarization, K+ channel and Ca cycling. Plus heterogenous sympathetic innervation.

Sudden death typical only if VT

VT = ventricular tachycardia

Single ventricular premature complex VPC

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Slide 2:

How is it diagnosed?

Slide 3:

How is it diagnosed?

- VT is most often seen when at rest, or rapid eye movement sleep
- During rest following excitement or exercise

Holter is a 24 hour recording of the ECG
Like minimum of 20 hours

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What constitutes a normal test?

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In 24 hours:
<50 ventricular premature beats is normal.

Slide 1:

What constitutes a normal test?

In 24 hours:

<50 ventricular premature beats is normal.

Between 50-60 beats, singles only is equivocal

> 60 beats, especially with pairs or triplets, is abnormal

< 50 with pairs or triplets is equivocal

Escape beats do not counts VPCs

Slide 2:

Ventricular escape beats

Ventricular premature beat

Slide 3:

Abnormal Holter

195 singles, 7 months

Slide 4:

Abnormal Holter

73,000 VE, 3500 runs, longest 14, 6 months

Slide 5:

Abnormal Holter
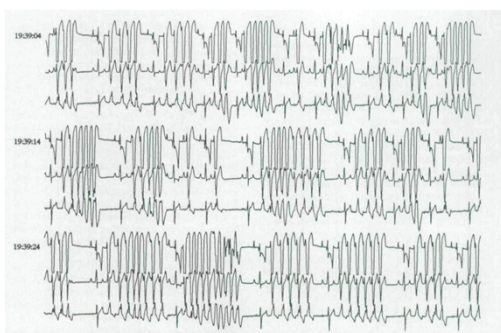
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Slide 6:

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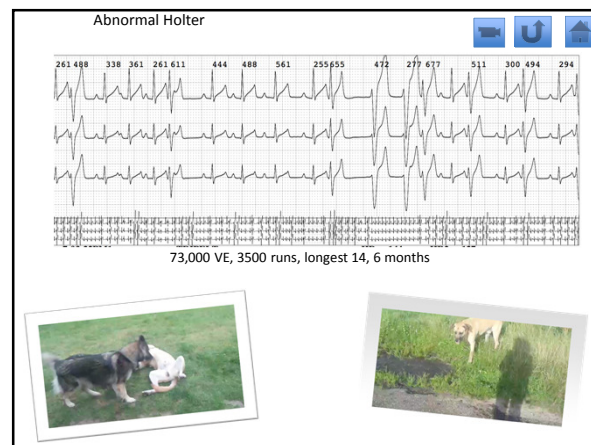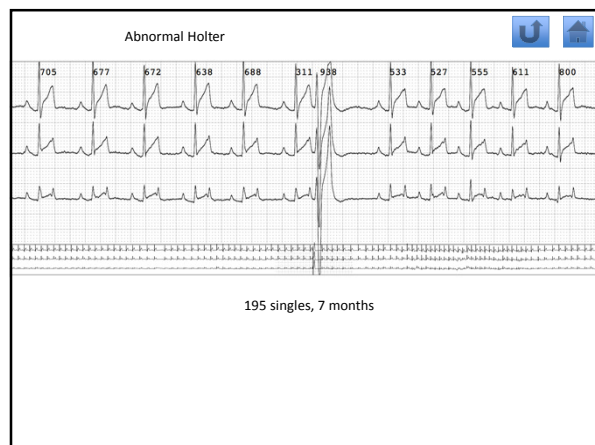What are the optimal ages for performing the Holter monitor?

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- Sudden death can occur anytime between 3 to 18 months
- Peak affected period appears to be 6-7 months.
- Arrhythmias will start to decrease after a year of age and may be completely gone by 18-24 months.
- Rare to have arrhythmias prior 3 months of age

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Ideal time if doing single Holter – 6-7 months of age

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Will the pup outgrow the condition?

Slide 3:

Will the pup outgrow the condition?
- VA is rare to see after 24 months
- Dogs reaching 2 years of age typically live normal life.

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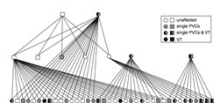What are the optimal ages for performing the Holter monitor?

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- 3 traits for heritability: 1) single VPCs 2) couplets 3) 3 or more VE as VT
- May be genetic variation for 3 traits
- No simple recessive or dominant inheritance. No indication of sex bias.
- Mildly affected dogs could produce dogs with VT. Matings between dogs with VT produced unaffected dogs, mild affected dogs and VT dogs
- Breeding unaffected to affected produced full spectrum
- One breeding of 2 unaffected dogs did not produce affected, but few pairings.
- Heritability for affectedness is very high

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- Medical therapy
  - Sotalol
  - Amiodarone
  - Mexilitine/tocainide

  - Proarrhythmia

- Pacemaker

- Defibrillator

- Nothing

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