

Client: **B6**
Patient:

B6

- Repeat chemistry this am
- +/- continue: **B6** (last dose at 6am)
- Maybe TGH tomorrow

B6 DVM
SOAP Text **B6** 9:19AM - Clinician, Unassigned FHSA

Day 3 Hospitalization

B6 yo MN Boxer

HISTORY:

Current history:

In July primary vet noticed heart arrhythmia during appointment, when he was seen then due to symptom of wheezing. rDVM started **B6**, and owners gave that for a couple of weeks and wheezing resolved, owners then stopped **B6** (they didn't know they were supposed to continue). About 1 week ago started wheezing again (sporadic), becoming more clingy and lethargic. Owner had been out of town for a week, **B6** was at home with husband and owner is unsure what other symptoms **B6** has. Owner's husband did restart **B6** on Tuesday. No vomiting/heaving. Owner reports that he is drinking water normally, but didn't finish his food this morning which is abnormal for him. Unknown diarrhea, appetite status while owner was gone.

Prior medical history: none, **B6**

Current medications: **B6** (owner unsure strength), did start it on Tuesday. Took months long break of **B6** due to symptoms resolving.

Diet: royal canin boxer, dry, unknown length of time (last 1.5-2 yrs); was on grain free diet before this

Vaccination status/flea & tick preventative use: **B6**

Travel history: none

Overnight update:

Patient starting to be a little interested in food. Arrhythmia still not well under control **B6** with intermittent R on T, pauses and AIVR, multiforme VPCs.

EXAM:

B6

C/V: II-III/VI left apical systolic murmur, arrhythmia (premature beats), ssfp
RESP: eupnic, normal bv sounds, no crackles/wheezes

Client:
Address:

B6

All Medical Records

Patient: **B6**
Breed: Boxer
DOB: **B6**

Species: Canine
Sex: Male
(Neutered)

Referring Information

B6

Client: **B6**
Patient:

Initial Complaint:

ARVC vs. DCM with active CHF and uncontrolled Vtach.

SOAP Text **B6** 9:34AM - Clinician, Unassigned FHSA

Subjective

NEW VISIT (ER)

Doctor: Dr. **B6**

Student: **B6** V'19

Presenting complaint: wheezing

Referral visit? **B6**

Diagnostics completed prior to visit - saw this morning but referred straight here
rDVM records in email

HISTORY:

Signalment: **B6** y/o MN Boxer

Current history:

In July primary vet noticed heart arrhythmia during appointment, was seen then due to symptom of wheezing. rDVM Started on **B6** owners gave that for a couple of weeks and wheezing resolved, owners then stopped **B6** 1 week ago started wheezing again (sporadic), became clingy and lethargic. Owner had been out of town for a week, **B6** was at home with husband and owner is unsure what other symptoms **B6** has. Owner's husband did restart **B6** on Tuesday. No vomiting/heaving. Owner reports that he is drinking water normally, but didn't finish his food this morning which is abnormal for him. Unknown diarrhea, appetite status while owner was gone.

Prior medical history: none, known **B6**

Client: **B6**
Patient: **B6**

Current medications: **B6** (owner unsure strength), did start it on Tuesday. Took months long break of **B6** due to symptoms resolving.

Diet: royal canin boxer, dry , unknown length of time (last 1.5-2 yrs)

Vaccination status/flea & tick preventative use: UTD

Travel history: none

EXAM:

B6

C/V: II-III/VI left apical systolic murmur, arrhythmia (premature beats, intermittent gallop), fair arterial pulses

RESP: moderate dyspnea, normal bv sounds, wheezing noticed when stressed (in radiology and cardiology); cough noted on exam

B6

B6

ASSESSMENT:

A1: Severe cardiomegaly with poor contractile function - r/o primary DCM, diet-induced cardiomyopathy, ARVC, tachycardiac induced cardiomyopathy.

A2: Malignant ventricular arrhythmia - non-sustained VTach and frequent polymorphic VPCs

A3: Left sided congestive heart failure.

PLAN:

B6 on presentation, then another **B6** during cardio consult, as well as first dose of **B6**

Treatments:

B6

Diagnostics completed:

- Thoracic radiographs:

B6

Client: **B6**
Patient: **B6**

B6

- Echocardiogram:

Findings consistent with DCM with active CHF and frequent ventricular arrhythmia. Patient has enough malignant arrhythmia that hospitalization and **B6** and telemetry monitoring is recommended. **B6** is recommended for the day and depending how well he responds, maybe we can decrease to q6-8h overnight. Patient has historically been on grain free diet for years before been switched to current diet. It is unclear whether this is a primary DCM, ARVC with DCM phenotype, or diet-induced cardiomyopathy, but **B6** Apparently patient tolerated well **B6** in the past, but at this point this medication should ideally be avoided at this point due to potential beta-blocker effects that may worsen systolic function. Thus, recommend bloodwork and if liver values are normal, **B6** (decreasing to SID after 5 days) should be started. **B6** may also be effective helping decrease ventricular arrhythmia density. Recommend addition of an **B6** when patient is eating and not azotemic. Recommend repeat echocardiogram in 3 months or sooner in case patient develops clinical signs consistent with progression of the disease (shortness breath, collapse, syncope, exercise intolerance, pale mucous membrane). Client can be instructed on how to use AliveCor and assess heart rate and rhythm from home if patient at rest and calm at home.

PLAN (cardio consult):

B6

Client communication:

B6

SOAP Text **B6** 8:27AM **B6**

B6

B6 yo MN Boxer

HISTORY:

Client:
Patient:

B6

Current history:

In July primary vet noticed heart arrythmia during appointment, when he was seen then due to symptom of wheezing. rDVM started **B6**, and owners gave that for a couple of weeks and wheezing resolved, owners then stopped **B6** (they didn't know they were supposed to continue). About 1 week ago started wheezing again (sporadic), becoming more clingy and lethargic. Owner had been out of town for a week, **B6** was at home with husband and owner is unsure what other symptoms **B6** has. Owner's husband did restart **B6** on Tuesday. No vomiting/heaving. Owner reports that he is drinking water normally, but didn't finish his food this morning which is abnormal for him. Unknown diarrhea, appetite status while owner was gone.

Prior medical history: none **B6**

Current medications: **B6** (owner unsure strength), did start it on Tuesday. Took months long break due to symptoms resolving. **B6**

Diet: royal canin boxer, dry, unknown length of time (last 1.5-2 yrs); was on grain free diet before this

Vaccination status/flea & tick preventative use: UTD on vaccines

Travel history: none

Overnight update: AIVR and occasional VPCs. Not interested in food. Nauseaus last night, was given one dose of **B6** that helped a little bit. Also had 2 episodes of vtach around 7am, resolved on own.

EXAM:

B6

C/V: II-III/VI left apical systolic murmur, arrhythmia (premature beats, intermittent gallop), fair arterial pulses
RESP: eupnic, normal bv sounds, no crackles/wheezes

B6

ASSESSMENT:

- A1: Severe cardiomegaly with poor contractile function - r/o primary DCM, diet-induced cardiomyopathy, ARVC, tachycardiac induced cardiomyopathy
- A2: Malignant ventricular arrhythmia - non-sustained VTach and frequent polymorphic VPCs
- A3: Left sided congestive heart failure

PLAN:

Treatment Plan **B6**
B6

Client: **B6**
Patient:

B6

- If patient continues to vomit while receiving: **B6**

Diagnosics completed:

- Thoracic radiographs **B6**

- Cardiopulmonary changes are consistent with left-sided congestive heart failure. Given moderate generalized cardiomegaly and moderate left atrial enlargement, consider DCM given breed. Echocardiography is recommended and repeat thoracic radiographs to monitor response to therapy.
- Impression of faint rounded soft tissue opacities mixed in with the intersitital pattern may represent peribronchial cuffing and end on vessels, pulmonary nodules are thought less likely. Follow-up radiographs to reassess the lungs are recommended after resolution of cardiogenic pulmonary edema.
- Concurrent mild diffuse bronchial pattern likely represents a component of lower airway disease.

- Echocardiogram/ Cardio recommendations **B6**

Findings consistent with DCM with active CHF and frequent ventricular arrhythmia. Patient has enough malignant arrhythmia that hospitalization and **B6** CRI and telemetry monitoring is recommended. **B6** 4-6h is recommended for the day and depending how well he responds, maybe we can decrease to q6-8h overnight. Patient has historically been on grain free diet for years before been switched to current diet. It is unclear whether this is a primary DCM, ARVC with DCM phenotype, or diet-induced cardiomyopathy, but **B6** are also recommended. Apparently patient tolerated well **B6** in the past, but at this point this medication should ideally be avoided at this point due to potential beta-blocker effects that may worsen systolic function. Thus, recommend bloodwork and if liver values are normal, **B6** (decreasing to SID after 5 days) should be started. Fish oil may also be effective helping decrease ventricular arrhythmia density. Recommend addition of an **B6** when patient is eating and not azotemic. Recommend repeat echocardiogram in 3 months or sooner in case patient develops clinical signs consistent with progression of the disease (shortness breath, collapse, syncope, exercise intolerance, pale mucous membrane). Client can be instructed on how to use AliveCor and assess heart rate and rhythm from home if patient at rest and calm at home.

PLAN:

B6

B6

Plan: **B6**

- Re-check chemistry

Client: **B6**
Patient:

B6

ASSESSMENT:

- A1: Severe cardiomegaly with poor contractile function - r/o primary DCM, diet-induced cardiomyopathy, ARVC, tachycardiac induced cardiomyopathy
- A2: Malignant ventricular arrhythmia - non-sustained VTach and frequent polymorphic VPCs
- A3: Left sided congestive heart failure

PLAN:

Diagnosics completed:

- Thoracic radiographs **B6**

- Cardiopulmonary changes are consistent with left-sided congestive heart failure. Given moderate generalized cardiomegaly and moderate left atrial enlargement, consider DCM given breed **B6**

B6

- Impression of faint rounded soft tissue opacities mixed in with the intersitital pattern may represent peribronchial cuffing and end on vessels, pulmonary nodules are thought less likely. Follow-up radiographs to reassess the lungs are recommended after resolution of cardiogenic pulmonary edema.

- Concurrent mild diffuse bronchial pattern likely represents a component of lower airway disease.

- Echocardiogram/ Cardio recommendation **B6**

Findings consistent with DCM with active CHF and frequent ventricular arrhythmia. Patient has enough malignant arrhythmia that hospitalization and **B6** and telemetry monitoring is recommended.

B6 q 4-6h is recommended for the day and depending how well he responds, maybe we can decrease to q6-8h overnight. Patient has historically been on grain free diet for years before been switched to current diet. It is unclear whether this is a primary DCM, ARVC with DCM phenotype, or diet-induced cardiomyopathy, but **B6** are also recommended. Apparently patient tolerated well **B6** in the past, **B6**

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B6

B6

Client: **B6**
Patient: **B6**

B6

Treatment Plan **B6**

B6

Plan **B6**

- Re-check chemistry

B6

- Repeat chemistry this am

- +/- **B6**

Plan **B6**

- Re-check chemistry this am

B6

B6 DVM

SOAP Text **B6** 7:17AM - Clinician, Unassigned FHSA

History:

B6 MN Boxer presented to rDVM **B6** for wheezing and decreased appetite at home for 1 week. rDVM referred to Tufts ER. O were on vacation and are unclear on exact symptoms and duration. Pt was previously seen at rDVM for wheezing in July where arrhythmia was noted and pt was started on **B6** (O unclear on dose). O discontinued **B6** when wheezing resolved. Was on grain-free diet until ~1.5 years ago.

Subjective:

B6

Client: **B6**
Patient: **B6**

Overall impression since arrival or since last exam: Improved since admission to ER of **B6**. The RR are back to normal and his has no RE. Ate for us a small amount this morning which is good. Seems slightly brighter. Telemetry revealed persistent multiform ventricular tachycardia with fast rate with no obvious improvement compared to previously.

Appetite: No immediate interest in food, ate when stimulated and hand fed.

Objective:

B6

Heart: Grade II-II/VI left apical systolic murmur. Multiple premature beats with short runs of sustained tachycardia.

Jugular veins bottom 1/3 of the neck. Femoral pulses fair with pulses deficits.

Lungs: Normal BV sounds bilaterally, no crackles or wheezes ausculted.

B6

Treatments in hospital

B6

Diagnostics

- Thoracic rads **B6** Moderate generalized cardiomegaly and moderate left atrial enlargement onsistent with left-sided congestive heart failure/DCM. Cardiogenic pulmonary edema. Concurrent mild diffuse bronchial pattern likely represents a component of lower airway disease.

- Echo (Abridged due to dyspnea **B6**) Findings consistent with DCM with active CHF and frequent ventricular arrhythmia. Severe cardiomegaly with poor contractile function.

B6

Assessments

A1: DCM vs. ARVC with DCM phenotype with history of active LCHF

A2: Malignant ventricular arrhythmia - non-sustained VTach and frequent polymorphic VPCs

Plan

1. **B6**
2.
3.

Client: **B6**
Patient:

4. **B6**
5.
6.

SOAP completed by: **B6** V19
SOAP reviewed by: **B6** DVM

Disposition/Recommendations

Client:
Patient:

B6

Client: **B6**
 Patient:

Cummings
Veterinary Medical Center
 AT TUFTS UNIVERSITY

Foster Hospital for Small Animals
 55 Willard Street
 North Grafton, MA 01536
 (508) 839-5395

Client: **B6**
 Veterinarian:
 Patient ID:
 Visit ID:

Patient:	B6
Species:	Canine
Breed:	Boxer
Sex:	Male (Neutered)
Age:	B6 years Old

Lab Results Report

Nova Full Panel-ICU **B6** 30:25 AM **Accession ID: B6**

Test	Results	Reference Range	Units
SO2%	B6	94 - 100	%
HCT (POC)		38 - 48	%
HB (POC)		12.6 - 16	g/dL
NA (POC)		140 - 154	mmol/L
K (POC)		3.6 - 4.8	mmol/L
CL(POC)		109 - 120	mmol/L
CA (ionized)		1.17 - 1.38	mmol/L
MG (POC)		0.1 - 0.4	mmol/L
GLUCOSE (POC)		80 - 120	mg/dL
LACTATE		0 - 2	mmol/L
BUN (POC)		12 - 28	mg/dL
CREAT (POC)		0.2 - 2.1	mg/dL
TCO2 (POC)		0 - 0	mmol/L
nCA		0 - 0	mmol/L
nMG		0 - 0	mmol/L
GAP		0 - 0	mmol/L
CA/MG		0 - 0	mol/mol
BEecf		0 - 0	mmol/L
BEb		0 - 0	mmol/L
A		0 - 0	mmHg
NOVA SAMPLE		0 - 0	



12/85

B6

Printed Monday, February 25, 2019

Client: **B6**
 Patient: **B6**

FiO2	B6	0 - 0	%
PCO2		36 - 44	mmHg
PO2		80 - 100	mmHg
PH		7.337 - 7.467	
PCO2		36 - 44	mmHg
PO2		80 - 100	mmHg
HCO3		18 - 24	mmol/L

Nova Full Panel-ICU **B6** 9:36:12 AM Accession ID: **B6**

Test	Results	Reference Range	Units
TS (FHSA)	B6	0 - 0	g/dl
PCV **		0 - 0	%
TS (FHSA)		0 - 0	g/dl

Nova Full Panel-ICU **B6** 9:56:25 AM Accession ID: **B6**

Test	Results	Reference Range	Units
GLUCOSE	B6	67 - 135	mg/dL
UREA		8 - 30	mg/dL
CREATININE		0.6 - 2	mg/dL
PHOSPHORUS		2.6 - 7.2	mg/dL
CALCIUM2		9.4 - 11.3	mg/dL
MAGNESIUM 2+		1.8 - 3	mEq/L
T. PROTEIN		5.5 - 7.8	g/dL
ALBUMIN		2.8 - 4	g/dL
GLOBULINS		2.3 - 4.2	g/dL
A/G RATIO		0.7 - 1.6	
SODIUM		140 - 150	mEq/L
CHLORIDE		106 - 116	mEq/L
POTASSIUM		3.7 - 5.4	mEq/L
tCO2 (BICARB)		14 - 28	mEq/L
AGAP		8 - 19	
NA/K		29 - 40	
T BILIRUBIN		0.1 - 0.3	mg/dL
ALK PHOS		12 - 127	U/L
GGT		0 - 10	U/L
ALT		14 - 86	U/L
AST		9 - 54	U/L
CK		22 - 422	U/L
CHOLESTEROL		82 - 355	mg/dL
TRIGLYCERIDES		30 - 338	mg/dl
AMYLASE		409 - 1250	U/L

1930 Result(s) verified



Client:
Patient:

B6

OSMOLALITY (CALCULATED)

B6

291 - 315

mmol/L

Nova Full Panel-ICU

B6

2:18:25 PM

Accession ID:

B6

Test	Results	Reference Range	Units
GLUCOSE		67 - 135	mg/dL
UREA		8 - 30	mg/dL
CREATININE		0.6 - 2	mg/dL
PHOSPHORUS		2.6 - 7.2	mg/dL
CALCIUM2		9.4 - 11.3	mg/dL
MAGNESIUM 2+		1.8 - 3	mEq/L
T. PROTEIN		5.5 - 7.8	g/dL
ALBUMIN		2.8 - 4	g/dL
GLOBULINS		2.3 - 4.2	g/dL
A/G RATIO		0.7 - 1.6	
SODIUM		140 - 150	mEq/L
CHLORIDE		106 - 116	mEq/L
POTASSIUM		3.7 - 5.4	mEq/L
iCO2 (BICARB)	B6	14 - 28	mEq/L
AGAP		8 - 19	
NA/K		29 - 40	
T BILIRUBIN		0.1 - 0.3	mg/dL
ALK PHOS		12 - 127	U/L
GGT		0 - 10	U/L
ALT		14 - 86	U/L
AST		9 - 54	U/L
CK		22 - 422	U/L
CHOLESTEROL		82 - 355	mg/dL
TRIGLYCERIDES		30 - 338	mg/dl
AMYLASE		409 - 1250	U/L
2888 Result(s) verified			
OSMOLALITY (CALCULATED)		291 - 315	mmol/L



B6

Client:
Patient:

B6

RDVM

B6

medical records 7/17/16

B6

B6

FAX COVER SHEET

Date:

B6

To: TDAS ER

Comments:

B6

Pages: _____

If you have received this fax in error, please contact

The **B6**

Thank you, and have a nice day!



01/10 #

B6

To:

From:

B6

Client: **B6**
Patient: **B6**

RDVM **B6** medical records 7/17/16 **B6**

B6

Patient Chart

Printed: **B6** 8:51a

CLIENT INFORMATION

Name
Address **B6**

PATIENT INFORMATION

Name	B6	Species	Canine
Sex	Male, Neutered	Breed	Boxer
Birthdate	B6	Age	10y
ID		Rabies	1959-16
Color	Brown	Weight	57.40 Lbs
Reminded	02-18-19	Codes	

Reminders for: **B6** Last done

06-12-20	B6
07-24-19	
07-24-19	
07-24-19	
05-26-19	
02-23-19	
08-14-18	
07-07-17	

B6 weight history

02-22-19	B6
12-26-17	
09-08-17	
06-13-17	
11-07-16	
07-07-16	
05-26-16	
07-17-15	
05-30-14	
10-28-13	
10-28-13	
05-06-13	
01-06-11	

MEDICAL HISTORY - S.O.A.P. View

Date	By	Code	Description	Qty (Variance)	Photo
B6	B6		NONWELL Non-Wellness Medical Record		

Age: 10y Weight: 57.40
BCS: **B6**

SUBJECTIVE SECTION

Client:
Patient:

B6

RDVM

B6

medical records 7/17/16

B6

B6

Patient Chart for **B6**
Date **B6** Time: 8:51a

Client: Ms **B6** Page: 2

Date	By	Code	Description	Qty (Variance)	Photo
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B6 (female owner) brought **B6** today... she just got home from a business trip and her husband told her that **B6** has been coughing at night and generally not doing well. There are notes of collapsing episodes in 2014 in our records (owner doesn't remember these) and we have auscultated an arrhythmia at visits since 2015. ARVC and cardiologist intervention has been discussed on numerous occasions but has always been declined. Dr. **B6** started **B6** or **B6** in July 2018 due to a profound arrhythmia, but the owners were unaware that this was something they should have continued long-term and stopped it a long time ago because **B6** had been doing well at home. His condition at home has declined in the last week or two and now they are seeing:

- a light wheeze-like outward coughing/chuffing intermittently throughout the day, but mostly at night
- generalized lethargy and exercise intolerance on walks
- appetite is decreased

OBJECTIVE SECTION

B6

ASSESSMENT SECTION

NOTES

10yo CM Boxer
 - hx cardiac arrhythmia (not worked up): suspect ARVC
 - new heart murmur, pulmonary crackles: suspect CHF... r/o primary pulmonary pathology

PLAN SECTION

NOTES

Discussed with **B6** certainly has ARVC which has never been worked up with a cardiologist and I fear that he is currently in heart failure. He needs to be evaluated by a cardiologist ASAP to get him started on medication which may help improve heart function and lessen frequency of arrhythmia. Things are now an emergency. **B6** will bring him to Tufts. Discussed that if he seems "stable" (understanding dogs with ARVC are ALWAYS at risk of sudden death) and/or owner has financial constraints he may be able to be evaluated as a day-case (admit through the ER for the day to facilitate

01/3/10

B6

10

09:58AM:FRM

B6

Client: **B6**
Patient:

RDVM **B6** medical records 7/17/16 **B6**

B6

Patient Chart for **B6**
Date: **B6** Time: 8:51a

Client: Ms **B6** Page: 3

Date	By	Code	Description	Qty (Variance)	Photo
07-24-18	B6	WELL	Wellness Annual Medical Record		

cardiac workup and home on oral meds). If he seems unstable they may recommend admission for monitoring overnight. Did not take CXR or perform diagnostics since Tufts will repeat these anyway.

Age: 9y

SUBJECTIVE SECTION

Annual exam. O does not take dog on long walks or runs anymore after the collapsing episode. Hx of arrhythmia, not seen a cardiologist. Lump on left shoulder growing. **B6**

OBJECTIVE SECTION

B6

ASSESSMENT SECTION

NOTES

- 1. Ventricular tachycardia
- 2. **B6**

PLAN SECTION

NOTES

B6

Recommend see cardiologist for consultation and further work up. **B6** Dog
at risk for sudden death. **B6**

Client:
Patient:

B6

RDVM

B6

medical records 7/17/16

B6

B6

Patient Chart for **B6**
Date: **B6** Time: 8:51a

Client: Ms. **B6** Page: 4

Date	By	Code	Description	Qty (Variance)	Photo
12-26-17	rx:		B6		

Age: 9y Weight: 53.60
BCS: 5.00 / 9.00

SUBJECTIVE SECTION

B6 No known trauma. Condition stable otherwise.

OBJECTIVE SECTION

Examination Results:
Eyes

B6 Slight

PLAN SECTION

NOTES

Disp 1:
2:
3:
B6

- 4. re check in 3 days or sooner if condition worsens.
- 5. e collar if rubbing eyes.
- 6. (see picture in record)

NONWELL Non-Wellness Medical Record

Age: 9y

SUBJECTIVE SECTION

See 2nd EMR above

09-08-17 **B6** PRO Recheck /or Brief Medical Record

Age: 9y Weight: 55.40

06-13-17 **B6** WELL Wellness Annual Medical Record

Age: 8y Weight: 53.30
BCS: 5.00 / 9.00

SUBJECTIVE SECTION

Annual exam. Doing well for an older dog. History of arrhythmia, no recent signs of weakness or collapse. He does tremble sometimes but o thinks that is due to nervousness. A couple new skin humps. O **B6** Lost 6 lbs since last year but

01 75 #

B6 10

08/58AM:Flowm

B6

Client: **B6**
Patient:

RDVM **B6** medical records 7/17/16 **B6**

B6

Patient Chart for **B6**
Date: **B6** Time: 8:51a

Client: Ms **B6** Page: 5

Date	By	Code	Description	Qty (Variance)	Photo
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they intentionally reduced the food

B6

Client: **B6**
Patient: **B6**

RDVM **B6** medical records 7/17/16 **B6**

B6

Patient Chart for: **B6**
Date: **B6** Time: 8:51a

Client: Ms: **B6** Page: 6

Date	By	Code	Description	Qty (Variance)	Photo
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B6

7/10

B6 To

09:58AM:FROM: **B6**

Client:
Patient:

B6

RDVM

B6

medical records 7/17/16-2/22/19

B6

Patient Chart for **B6**
Date **B6** Time: 8:51a

Client: **B6**

Page: 7

Date	By	Code	Description	Qty (Variance)	Photo
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B6

PLAN SECTION

NOTES

B6

07-07-16

B6 WELL Wellness Annual Medical Record
 Client Instructions - We will call tomorrow testing results (no call means clear).
 Please call if you would like to further discuss or schedule and echocardiogram and EKG to check his heart.

Age: 7y Weight: 60.00 Respiration: 28.00 Pulse: **B6**
 CRT: **B6**

SUBJECTIVE SECTION

7yo CM Boxer: **B6**

B6

OBJECTIVE SECTION

BAR, mm pink.

Examination Results:
 Heart
 Arrhythmia ausculted with occasional dropped pulses.

B6

ASSESSMENT SECTION

NOTES

B6

PLAN SECTION

NOTES

Client: **B6**
Patient: **B6**

RDVM: **B6** medical records 7/17/16 **B6**

B6

Patient Chart for **B6**
Date: **B6** Time: 8:51a

Client: Ms **B6** Page: 8

Date	By	Code	Description	Qty (Variance)	Photo
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05-26-16		MB WELL	4dx fecal B6 Wellness Annual Medical Record		
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Age: 7y Weight: 63.00

SUBJECTIVE SECTION

B6

PLAN SECTION

NOTES

B6

07-17-15		CJC WELL	Wellness Annual Medical Record		
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B6

Age: 6y Weight: 63.70 Pulse: 136.00
CRT: 2 secs. BCS: 5.50 / 9.00

SUBJECTIVE SECTION

6yo CM Boxer. Doing well at home with no concerns. Hx collapsing episodes reported last year seem to have resolved but O's wife no longer takes him on runs anymore. No obvious exercise intolerance. On HW and flea/tick prevention. Good appetite/energy. O use **B6**

OBJECTIVE SECTION

BAR, mm pink.

Examination Results:

Heart

NMA, when ausculted in exam room normal rhythm, when took out back to listen again once calmed down may have been a slight pause between a couple beats but synchronous pulses.

Oral / Nasal

B6

Normal Systems: Coat & Skin, Eyes, Ears, Lungs, Abdominal Palpation, Gastrointestinal, Lymph Nodes, Urogenital, Neurologic, Musculoskeletal

ASSESSMENT SECTION

01 / 8 #

B6

09:58AM From: **B6**

Client: **B6**
Patient: **B6**

RDVM **B6** medical records 7/17/16 **B6**

B6

Patient Chart for **B6**
Date **B6** Time: 8:51a

Client: **B6** Page: 9

Date	By	Code	Description	Qty (Variance)	Photo
------	----	------	-------------	----------------	-------

NOTES

6yo CM Boxer. Hx collapsing episodes during exercise r/o ARVC.

PLAN SECTION

NOTES

4dx, fecal

B6

Recommend echo with EKG, gave handout on ARVC in boxers. Recommend call with questions or to schedule.

05-30-14		CONWW	Converted Weight	0	
	Age: 5y	Weight: 60.80			
10-28-13		CONWW	Converted Weight	0	
	Age: 5y	Weight: 58.70			
		CONWW	Converted Weight	0	
	Age: 5y	Weight: 58.70			
05-06-13		CONWW	Converted Weight	0	
	Age: 4y	Weight: 59.30			
01-06-11		CONWW	Converted Weight	0	
	Age: 2y	Weight: 55.00			

10/10

B6 To

From: **B6**

Client: **B6**
Patient: **B6**

CBC/Chem **B6**



Tufts Cummings School Of Veterinary Medicine

200 Westboro Road
North Grafton, MA 01536

DUPLICATE

Name/DOB: Patient ID: Phone number: Collection Date: Approval date:	B6	Sex: CM Age: 10 Species: Canine Breed: Boxer	Provider: B6 Order Location: V320539: Investigation into Sample ID: 1902220072
---	-----------	---	---

CBC, Comprehensive, Sm Animal (Research)

Parameter	Value	Ref. Range/Males
SMACHUNSKI	B6	
WBC (ADVIA)	B6	4.40-15.10 K/uL
RBC (Advia)	B6	5.80-8.50 M/uL
Hemoglobin (ADVIA)	B6	13.3-20.5 g/dL
Hematocrit (Advia)	B6	39-55 %
MCV (ADVIA)	B6	64.5-77.5 fL
MCH (ADVIA)	B6	21.3-25.9 pg
CHCM	B6	
MCHC (ADVIA)	B6	31.9-34.3 g/dL
RDW (ADVIA)	B6	11.9-15.2
Platelet Count (Advia)	B6	173-486 K/uL
02/22/19 1:35 PM		
Slight Platelet clumping present. Platelet estimate and/or platelet count may be affected. Platelet Crit is invalid when platelet clumping is present with the Advia platelet methodology. 10-25 platelets per 100x field (estimated count of 200,000-500,000/uL)		
Mean Platelet Volume (Advia)	B6	8.29-13.20 fl
02/22/19 1:13 PM		
Platelet clumps (if present) and sample age (greater than 4 hours) can result in a falsely increased MPV.		
Platelet Crit	B6	0.129-0.403 %
02/22/19 1:13 PM		
Platelet Crit is invalid when clumped platelets are present. Interpretation of PltCt is unclear in species other than canines.		
PDW	B6	
Reticulocyte Count (Advia)	B6	0.20-1.60 %
Absolute Reticulocyte Count (Advia)	B6	14.7-113.7 K/uL
CHr	B6	
MCVr	B6	

Microscopic Exam of Blood Smear (Advia)

Parameter	Value	Ref. Range/Males
SMACHUNSKI	B6	
Seg Neuts (%)	B6	43-86 %
Lymphocytes (%)	B6	7-47 %
Monocytes (%)	B6	1-15 %
Nucleated RBC	B6	0-1 /100 WBC
02/22/19 1:13 PM		
WHITE blood cell count has been corrected for the presence of nucleated red blood cells		
Seg Neutrophils (Abs) Advia	B6	2.800-11.500 K/uL
Lymphs (Abs) Advia	B6	1.00-4.80 K/uL
Mono (Abs) Advia	B6	0.10-1.50 K/uL
WBC Morphology	B6	

Sample ID: 19022200721
This report continues... (Final)

Reviewed by: _____

Client: **B6**
Patient:

CBC/Chem **B6**



Tufts Cummings School Of Veterinary Medicine

200 Westboro Road
North Grafton, MA 01536

DUPLICATE

Name/DOB: Patient ID: Phone number: Collection Date: Approval date:	B6	Sex: CM Age: 10 Species: Canine Breed: Boxer	Provider: B6 Order Location: V320559: Investigation into Sample ID: 1902220072
---	-----------	---	---

Microscopic Exam of Blood Smear (Advia) (cont'd)

SMACHUNSKI Ref. Range/Males
Echinocytes **B6**

Research Chemistry Profile - Small Animal (Cobas)

	Ref. Range/Males
CSTCYR	
Glucose	67-135 mg/dL
Urea	8-30 mg/dL
Creatinine	0.6-2.0 mg/dL
Phosphorus	2.6-7.2 mg/dL
Calcium 2	9.4-11.3 mg/dL
Magnesium 2+	1.8-3.0 mEq/L
Total Protein	5.5-7.8 g/dL
Albumin	2.8-4.0 g/dL
Globulins	2.3-4.2 g/dL
A/G Ratio	0.7-1.6
Sodium	140-150 mEq/L
Chloride	106-116 mEq/L
Potassium	3.7-5.4 mEq/L
tCO2(Bicarb)	14-28 mEq/L
AGAP	8.0-19.0
NA/K	29-40
Total Bilirubin	0.10-0.30 mg/dL
Alkaline Phosphatase	12-127 U/L
GGT	0-10 U/L
ALT	14-86 U/L
AST	9-54 U/L
Creatine Kinase	22-422 U/L
Cholesterol	82-355 mg/dL
Triglycerides	30-338 mg/dL
Amylase	409-1250 U/L
Osmolality (calculated)	291-315 mmol/L

Sample ID: 19022200722
REPRINT: Orig. printing on 2/22/2019 (Final)

Reviewed by: _____
Page 2

Client: **B6**
Patient: **B6**

IDEXX BNP **B6**

IDEXX Reference Laboratories

Client: **B6** Patient: **B6**

Client: **B6**
Patient: **B6**
Species: CANINE
Breed: BOXER
Gender: MALE NEUTERED
Age: 11Y

Date: **B6**
Request ID: 1433993
Accession #: **B6**
Ordered by: **B6**

IDEXX VetConnect 1-888-433-9967
TUFTS UNIVERSITY
200 WES TEBORO RD
NORTH GRAFTON, Massachusetts 01536
508-839-5395
Account #88933

CARDIOPEP I proBNP - CANINE

Test	Unit	Reference Range	Obs	Method	Stat
CARDIOPEP I proBNP - CANINE	B6	0 - 900 pmol/L	HIGH		B6

Comments:

1 **B6**

Please note: Complete interpretive comments for all concentrations of Cardiotest proBNP are available in the online directory of services. Serum specimens received at room temperature may have decreased NT-proBNP concentrations.

Result is greater than 10000 pmol/L

Client: **B6**
 Patient: **B6**

Diet history

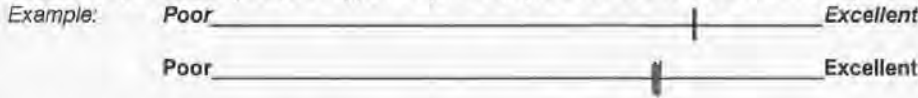
CARDIOLOGY DIET HISTORY FORM

Please answer the following questions about your pet

B6

Pet's name: **B6** Owner's name: **B6** Today's date: **B6**

1. How would you assess your pet's appetite? (mark the point on the line below that best represents your pet's appetite)



2. Have you noticed a change in your pet's appetite over the last 1-2 weeks? (check all that apply)
 Eats about the same amount as usual Eats less than usual Eats more than usual
 Seems to prefer different foods than usual Other _____

3. Over the last few weeks, has your pet (check one)
 Lost weight Gained weight Stayed about the same weight Don't know

1. Please list below ALL pet foods, people food, treats, snack, dental chews, rawhides, and any other food item that your pet currently eats and that you have fed in the last 2 years.

Please provide enough detail that we could go to the store and buy the exact same food - examples are shown in the table

Food (include specific product and flavor)	Form	Amount	How often?	Dates fed
Nutro Grain Free Chicken, Lentil, & Sweet Potato Adult	dry	1 1/2 cup	2x/day	Jan 2016-present
85% lean hamburger	microwaved	3 oz	1x/week	June -Aug 2016
Pupperoni original beef flavor	treat	1/2	1x/day	Sept 2016-present
Rawhide	treat	6 inch twist	1x/week	Dec 2018-present
Wellness Complete Health - Sweet Potato & Fish	dry	1 cup	2x/day	2012-2018
Motter Hubbard's Grainfree	dry	1 cup	2x/day	2008-2012
Milkbone brushing chews	treat		1x/day	2018-2019
Milkbone treat	treats		2-3x/day	long-time
Royal Canine Baker	Dry	1 cup	2x/day	2018-present
Wellness Soft Bites Lamb & Salmon Grainfree	treats		1x/day	long-time

*Any additional diet information can be listed on the back of this sheet

2. Do you give any dietary supplements to your pet (for example: vitamins, glucosamine, fatty acids, or any other supplements)? Yes No If yes, please list which ones and give brands and amounts:

	Brand/Concentration	Amount per day
Taurine <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	_____	_____
Carnitine <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	_____	_____
Antioxidants <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	_____	_____
Multivitamin <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	_____	_____
Fish oil <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	_____	_____
Coenzyme Q10 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	_____	_____
Other (please list): Example: Vitamin C	Nature's Bounty	500 mg tablets - 1 per day
_____	_____	_____
_____	_____	_____
_____	_____	_____

3. How do you administer pills to your pet?

- I do not give any medications
 - I put them directly in my pet's mouth without food
 - I put them in my pet's dog/cat food
 - I put them in a Pill Pocket or similar product
 - I put them in foods (list foods): cheese, Peppersoni
- with sweet to RC create*

Client:
Patient:

B6

Vitals Results

10:25:01 AM	Lasix treatment note
10:36:48 AM	Weight (kg)
10:58:00 AM	Lasix treatment note
12:43:21 PM	Eliminations
12:43:37 PM	Nursing note
12:44:22 PM	Quantify IV Fluids (CRI) in mls
12:50:46 PM	Cardiac rhythm
12:50:47 PM	Heart Rate (/min)
12:52:26 PM	Respiratory Rate
1:00:33 PM	Eliminations
1:10:19 PM	Quantify IV Fluids (CRI) in mls
1:10:20 PM	Catheter Assessment
2:03:55 PM	Cardiac rhythm
2:03:56 PM	Heart Rate (/min)
2:04:50 PM	Respiratory Rate
2:25:32 PM	Lasix treatment note
2:40:57 PM	Eliminations
3:00:23 PM	Cardiac rhythm
3:00:24 PM	Heart Rate (/min)
3:01:00 PM	Respiratory Rate
3:49:48 PM	Cardiac rhythm
3:49:49 PM	Heart Rate (/min)
3:50:33 PM	Respiratory Rate
4:05:52 PM	Eliminations
4:07:29 PM	Eliminations
4:07:44 PM	Nursing note
4:31:46 PM	Nursing note
5:00:16 PM	Cardiac rhythm
5:00:17 PM	Heart Rate (/min)
5:05:10 PM	Respiratory Rate
5:38:29 PM	Eliminations
5:38:44 PM	Amount eaten
5:55:28 PM	Nursing note
5:03:19 PM	Cardiac rhythm
5:03:20 PM	Heart Rate (/min)
5:04:06 PM	Respiratory Rate
5:24:06 PM	Quantify IV Fluids (CRI) in mls

B6

B6

Client:
Patient:

B6

Vitals Results

6:24:07 PM	Catheter Assessment
6:51:37 PM	Cardiac rhythm
6:51:38 PM	Heart Rate (/min)
6:51:49 PM	Respiratory Rate
7:51:32 PM	Respiratory Rate
7:52:03 PM	Cardiac rhythm
7:52:04 PM	Heart Rate (/min)
7:53:44 PM	Lasix treatment note
8:45:01 PM	Eliminations
8:52:50 PM	Cardiac rhythm
8:52:51 PM	Heart Rate (/min)
8:59:02 PM	Respiratory Rate
9:25:37 PM	Quantify IV Fluids (CRI) in mls
9:25:38 PM	Catheter Assessment
9:49:17 PM	Cardiac rhythm
9:49:18 PM	Heart Rate (/min)
9:56:13 PM	Respiratory Rate
10:51:19 PM	Cardiac rhythm
10:51:20 PM	Heart Rate (/min)
10:52:28 PM	Respiratory Rate
11:34:01 PM	Amount eaten
11:55:25 PM	Respiratory Rate
11:55:36 PM	Eliminations
11:55:46 PM	Cardiac rhythm
11:55:47 PM	Heart Rate (/min)
1:00:00 AM	Cardiac rhythm
1:00:01 AM	Heart Rate (/min)
1:00:21 AM	Respiratory Rate
1:52:25 AM	Lasix treatment note
1:52:38 AM	Eliminations
1:53:31 AM	Respiratory Rate
1:53:43 AM	Quantify IV Fluids (CRI) in mls
1:53:44 AM	Catheter Assessment
1:54:09 AM	Cardiac rhythm
1:54:10 AM	Heart Rate (/min)
2:16:55 AM	Eliminations
2:33:32 AM	Eliminations
2:39:52 AM	Cardiac rhythm
2:39:53 AM	Heart Rate (/min)
3:36:15 AM	Cardiac rhythm
3:36:16 AM	Heart Rate (/min)

B6

B6

Client:
Patient:

B6

Vitals Results

3:41:17 AM	Respiratory Rate
3:41:27 AM	Eliminations
4:49:07 AM	Cardiac rhythm
4:49:08 AM	Heart Rate (/min)
4:49:51 AM	Respiratory Rate
5:28:53 AM	Respiratory Rate
5:29:07 AM	Quantify IV Fluids (CRI) in mls
5:29:08 AM	Catheter Assessment
5:36:36 AM	Temperature (F)
5:56:48 AM	Cardiac rhythm
5:56:49 AM	Heart Rate (/min)
6:56:08 AM	Cardiac rhythm
6:56:09 AM	Heart Rate (/min)
6:56:56 AM	Respiratory Rate
7:37:07 AM	Weight (kg)
7:37:52 AM	Eliminations
7:58:21 AM	Cardiac rhythm
7:58:22 AM	Heart Rate (/min)
7:59:12 AM	Respiratory Rate
9:09:20 AM	Cardiac rhythm
9:09:21 AM	Heart Rate (/min)
9:33:45 AM	Respiratory Rate
10:02:14 AM	Cardiac rhythm
10:02:15 AM	Heart Rate (/min)
10:05:31 AM	Respiratory Rate
10:05:43 AM	Catheter Assessment
10:05:50 AM	Lasix treatment note
11:06:13 AM	Cardiac rhythm
11:06:14 AM	Heart Rate (/min)
11:07:32 AM	Respiratory Rate
11:27:21 AM	Eliminations
11:27:43 AM	Amount eaten
12:23:03 PM	Cardiac rhythm
12:23:04 PM	Heart Rate (/min)
12:26:12 PM	Respiratory Rate
1:04:31 PM	Cardiac rhythm
1:04:32 PM	Heart Rate (/min)
1:05:24 PM	Respiratory Rate
1:20:37 PM	Catheter Assessment

B6

B6

Vitals Results

1:55:09 PM	Cardiac rhythm
1:55:10 PM	Heart Rate (/min)
1:55:50 PM	Respiratory Rate
2:52:23 PM	Cardiac rhythm
2:52:24 PM	Heart Rate (/min)
2:53:23 PM	Respiratory Rate
3:12:08 PM	Eliminations
3:50:24 PM	Respiratory Rate
3:50:40 PM	Cardiac rhythm
3:50:41 PM	Heart Rate (/min)
4:49:31 PM	Respiratory Rate
4:54:01 PM	Cardiac rhythm
4:54:02 PM	Heart Rate (/min)
5:22:43 PM	Catheter Assessment
5:33:09 PM	Amount eaten
5:46:40 PM	Respiratory Rate
5:46:52 PM	Cardiac rhythm
5:46:53 PM	Heart Rate (/min)
6:00:15 PM	Amount eaten
6:20:32 PM	Lasix treatment note
6:30:51 PM	Eliminations
7:00:21 PM	Cardiac rhythm
7:00:22 PM	Heart Rate (/min)
7:08:36 PM	Respiratory Rate
8:00:49 PM	Eliminations
8:07:32 PM	Cardiac rhythm
8:07:33 PM	Heart Rate (/min)
8:08:32 PM	Respiratory Rate
9:00:28 PM	Cardiac rhythm
9:00:29 PM	Heart Rate (/min)
9:06:37 PM	Respiratory Rate
9:17:59 PM	Catheter Assessment
9:36:52 PM	Eliminations
9:40:20 PM	Respiratory Rate
9:41:25 PM	Cardiac rhythm
9:41:26 PM	Heart Rate (/min)
11:21:33 PM	Cardiac rhythm
11:21:34 PM	Heart Rate (/min)
11:22:05 PM	Respiratory Rate
11:24:38 PM	Amount eaten
11:27:39 PM	Weight (kg)

B6

B6

Client: **B6**
Patient:

Vitals Results

12:10:14 AM	Cardiac rhythm
12:10:15 AM	Heart Rate (/min)
12:10:41 AM	Respiratory Rate
1:02:51 AM	Catheter Assessment
1:03:53 AM	Cardiac rhythm
1:03:54 AM	Heart Rate (/min)
1:04:19 AM	Respiratory Rate
1:05:57 AM	Eliminations
1:22:13 AM	Respiratory Rate
1:22:23 AM	Eliminations
1:22:32 AM	Nursing note
1:57:47 AM	Lasix treatment note
2:00:09 AM	Cardiac rhythm
2:00:10 AM	Heart Rate (/min)
2:59:53 AM	Cardiac rhythm
2:59:54 AM	Heart Rate (/min)
3:03:46 AM	Respiratory Rate
3:04:41 AM	Eliminations
3:51:27 AM	Respiratory Rate
3:58:14 AM	Cardiac rhythm
3:58:15 AM	Heart Rate (/min)
4:58:50 AM	Catheter Assessment
5:06:40 AM	Weight (kg)
5:06:48 AM	Eliminations
5:06:59 AM	Temperature (F)
5:08:17 AM	Cardiac rhythm
5:08:18 AM	Heart Rate (/min)
5:08:31 AM	Respiratory Rate
5:14:08 AM	Amount eaten
5:48:40 AM	Cardiac rhythm
5:48:41 AM	Heart Rate (/min)
5:48:58 AM	Respiratory Rate
5:48:56 AM	Cardiac rhythm
5:48:57 AM	Heart Rate (/min)
5:49:50 AM	Respiratory Rate
7:40:17 AM	Eliminations
8:00:06 AM	Cardiac rhythm
8:00:07 AM	Heart Rate (/min)
8:01:08 AM	Respiratory Rate
9:04:42 AM	Respiratory Rate
9:10:17 AM	Cardiac rhythm

B6

B6

Client: **B6**
Patient:

Vitals Results

9:10:18 AM	Heart Rate (/min)
9:53:51 AM	Cardiac rhythm
9:53:52 AM	Heart Rate (/min)
10:00:19 AM	Respiratory Rate
10:01:02 AM	Lasix treatment note
10:01:17 AM	Catheter Assessment
10:02:17 AM	Eliminations
11:05:02 AM	Respiratory Rate
11:06:36 AM	Cardiac rhythm
11:06:37 AM	Heart Rate (/min)
11:31:26 AM	Amount eaten
12:11:21 PM	Cardiac rhythm
12:11:22 PM	Heart Rate (/min)
12:13:06 PM	Respiratory Rate
12:55:17 PM	Respiratory Rate
12:55:33 PM	Cardiac rhythm
12:55:34 PM	Heart Rate (/min)
12:59:07 PM	Eliminations
12:59:18 PM	Catheter Assessment
1:49:53 PM	Respiratory Rate
1:50:09 PM	Cardiac rhythm
1:50:10 PM	Heart Rate (/min)
3:10:31 PM	Respiratory Rate
3:11:24 PM	Cardiac rhythm
3:11:25 PM	Heart Rate (/min)
4:04:23 PM	Cardiac rhythm
4:04:24 PM	Heart Rate (/min)
4:04:40 PM	Respiratory Rate
5:04:41 PM	Cardiac rhythm
5:04:42 PM	Heart Rate (/min)
5:04:55 PM	Respiratory Rate
5:11:38 PM	Eliminations
5:19:41 PM	Amount eaten
5:31:53 PM	Amount eaten
5:35:31 PM	Catheter Assessment
5:57:20 PM	Cardiac rhythm
5:57:21 PM	Heart Rate (/min)
5:57:37 PM	Respiratory Rate

B6

B6

Client:
Patient:

B6

Vitals Results

7:23:42 PM	Cardiac rhythm
7:23:43 PM	Heart Rate (/min)
7:24:28 PM	Respiratory Rate
7:56:19 PM	Cardiac rhythm
7:56:20 PM	Heart Rate (/min)
7:56:35 PM	Respiratory Rate
8:11:41 PM	Eliminations
8:11:50 PM	Weight (kg)
8:46:12 PM	Cardiac rhythm
9:17:13 PM	Catheter Assessment
9:17:21 PM	Lasix treatment note
9:18:03 PM	Cardiac rhythm
9:18:04 PM	Heart Rate (/min)
9:19:25 PM	Respiratory Rate
9:23:52 PM	Weight (kg)
9:24:05 PM	Eliminations
9:53:36 PM	Cardiac rhythm
9:53:37 PM	Heart Rate (/min)
9:53:49 PM	Respiratory Rate
11:08:13 PM	Cardiac rhythm
11:08:14 PM	Heart Rate (/min)
11:08:51 PM	Respiratory Rate
11:09:13 PM	Amount eaten
12:11:22 AM	Cardiac rhythm
12:11:23 AM	Heart Rate (/min)
12:12:14 AM	Respiratory Rate
12:50:11 AM	Cardiac rhythm
12:50:12 AM	Heart Rate (/min)
12:50:28 AM	Respiratory Rate
12:50:56 AM	Catheter Assessment
2:11:35 AM	Cardiac rhythm
2:11:36 AM	Heart Rate (/min)
2:12:04 AM	Eliminations
2:15:50 AM	Respiratory Rate
3:09:06 AM	Cardiac rhythm
3:09:07 AM	Heart Rate (/min)
3:09:21 AM	Respiratory Rate
4:42:38 AM	Cardiac rhythm
4:42:39 AM	Heart Rate (/min)
4:42:59 AM	Respiratory Rate
5:32:29 AM	Catheter Assessment

B6

B6

Client: **B6**
Patient:

Vitals Results

5:32:40 AM	Respiratory Rate
5:32:49 AM	Cardiac rhythm
5:32:50 AM	Heart Rate (/min)
5:41:15 AM	Eliminations
5:41:26 AM	Weight (kg)
5:45:16 AM	Temperature (F)
5:45:27 AM	Amount eaten
5:58:53 AM	Cardiac rhythm
5:58:54 AM	Heart Rate (/min)
5:59:10 AM	Respiratory Rate
7:26:07 AM	Respiratory Rate
7:28:28 AM	Cardiac rhythm
7:28:29 AM	Heart Rate (/min)
7:52:07 AM	Cardiac rhythm
7:52:08 AM	Heart Rate (/min)
7:54:41 AM	Respiratory Rate
9:01:52 AM	Cardiac rhythm
9:01:53 AM	Heart Rate (/min)
9:09:06 AM	Respiratory Rate
9:22:41 AM	Eliminations
10:03:30 AM	Cardiac rhythm
10:03:31 AM	Heart Rate (/min)
10:21:53 AM	Catheter Assessment
10:22:05 AM	Respiratory Rate
10:25:31 AM	Lasix treatment note
10:51:49 AM	Cardiac rhythm
10:51:50 AM	Heart Rate (/min)
10:57:46 AM	Respiratory Rate
12:03:00 PM	Cardiac rhythm
12:03:01 PM	Heart Rate (/min)
12:03:41 PM	Respiratory Rate
12:59:10 PM	Cardiac rhythm
12:59:11 PM	Heart Rate (/min)
1:00:11 PM	Respiratory Rate
1:06:35 PM	Eliminations
1:07:04 PM	Catheter Assessment
1:58:26 PM	Cardiac rhythm
1:58:27 PM	Heart Rate (/min)
1:59:52 PM	Respiratory Rate
2:49:26 PM	Cardiac rhythm

B6

B6

Client: **B6**
Patient:

Vitals Results

B6

2:49:27 PM	Heart Rate (/min)
2:49:40 PM	Respiratory Rate
3:47:30 PM	Cardiac rhythm
3:47:31 PM	Heart Rate (/min)
3:47:42 PM	Respiratory Rate

B6

Client:
Patient:

B6

ECG from Cardio

B6

B6

11:43:38 AM

Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client:
Patient:

B6

ECG from Cardio

B6

B6

11:45:45 AM

Page 1 of 2

Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client:
Patient:

B6

ECG from Cardio

B6

B6

11:45:45 AM

Page 2 of 2

Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client: **B6**
Patient:

ECG from Cardio

B6

B6 11:46:06 AM
Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client:
Patient:

B6

ECG from Cardio

B6

B6

11:46:06 AM

Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client:
Patient:

B6

ECG from Cardio

B6

B6

:48:08 AM

Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client:
Patient:

B6

ECG from Cardio

B6

B6

11:50:34 AM

Tufts University
Tufts Cummings School of Vet Med
Cardiology

B6

Client:
Patient:

B6

Patient History

09:15 AM	UserForm
09:30 AM	Purchase
09:36 AM	Labwork
09:36 AM	Purchase
10:10 AM	UserForm
10:16 AM	Purchase
10:16 AM	Treatment
10:25 AM	Vitals
10:34 AM	UserForm
10:36 AM	Vitals
10:46 AM	UserForm
10:52 AM	Deleted Reason
10:52 AM	Deleted Reason
10:52 AM	Treatment
10:58 AM	Vitals
11:36 AM	Treatment
11:47 AM	Purchase
12:01 PM	Prescription
12:02 PM	Prescription
12:43 PM	Vitals
12:43 PM	Vitals
12:44 PM	Vitals
12:50 PM	Purchase
12:50 PM	Purchase
12:50 PM	Treatment
12:50 PM	Vitals
12:50 PM	Vitals
12:52 PM	Treatment
12:52 PM	Vitals
01:00 PM	Treatment
01:00 PM	Vitals
01:00 PM	Treatment
01:10 PM	Treatment
01:10 PM	Vitals

B6

B6

Client: **B6**
Patient:

Patient History

01:10 PM	Vitals
01:26 PM	Purchase
01:26 PM	Purchase
01:26 PM	Purchase
01:42 PM	Purchase
01:42 PM	Purchase
02:03 PM	Treatment
02:03 PM	Vitals
02:03 PM	Vitals
02:04 PM	Treatment
02:04 PM	Vitals
02:11 PM	Purchase
02:11 PM	Purchase
02:25 PM	Vitals
02:40 PM	Treatment
02:40 PM	Vitals
03:00 PM	Treatment
03:00 PM	Vitals
03:00 PM	Vitals
03:01 PM	Treatment
03:01 PM	Vitals
03:49 PM	Treatment
03:49 PM	Vitals
03:49 PM	Vitals
03:50 PM	Treatment
03:50 PM	Vitals
04:05 PM	Vitals
04:07 PM	Vitals
04:07 PM	Vitals
04:24 PM	Deleted Reason
04:30 PM	Deleted Reason
04:31 PM	Vitals
04:32 PM	Prescription
05:00 PM	Treatment
05:00 PM	Vitals
05:00 PM	Vitals
05:05 PM	Treatment
05:05 PM	Vitals

B6

B6

Client:
Patient:

B6

Patient History

05:16 PM	Treatment
05:38 PM	Treatment
05:38 PM	Vitals
05:38 PM	Treatment
05:38 PM	Vitals
05:39 PM	Treatment
05:55 PM	Vitals
06:03 PM	Treatment
06:03 PM	Vitals
06:03 PM	Vitals
06:04 PM	Treatment
06:04 PM	Vitals
06:24 PM	Treatment
06:24 PM	Vitals
06:24 PM	Vitals
06:49 PM	Prescription
06:51 PM	Treatment
06:51 PM	Vitals
06:51 PM	Vitals
06:51 PM	Treatment
06:51 PM	Vitals
07:51 PM	Treatment
07:51 PM	Treatment
07:51 PM	Vitals
07:52 PM	Treatment
07:52 PM	Vitals
07:52 PM	Vitals
07:53 PM	Vitals
07:53 PM	Treatment
08:45 PM	Vitals
08:52 PM	Treatment
08:52 PM	Treatment
08:52 PM	Vitals
08:52 PM	Vitals
08:59 PM	Treatment
08:59 PM	Vitals
09:09 PM	Treatment
09:09 PM	Treatment
09:25 PM	Treatment
09:25 PM	Vitals
09:25 PM	Vitals

B6

B6

Client:
Patient:

B6

Patient History

09:49 PM	Treatment
09:49 PM	Vitals
09:49 PM	Vitals
09:56 PM	Treatment
09:56 PM	Vitals
10:51 PM	Treatment
10:51 PM	Vitals
10:51 PM	Vitals
10:52 PM	Treatment
10:52 PM	Vitals
11:34 PM	Treatment
11:34 PM	Vitals
11:55 PM	Treatment
11:55 PM	Vitals
11:55 PM	Treatment
11:55 PM	Vitals
11:55 PM	Treatment
11:55 PM	Vitals
11:55 PM	Vitals
12:00 AM	Purchase
01:00 AM	Treatment
01:00 AM	Vitals
01:00 AM	Vitals
01:00 AM	Treatment
01:00 AM	Vitals
01:00 AM	Treatment
01:52 AM	Vitals
01:52 AM	Treatment
01:52 AM	Vitals
01:53 AM	Treatment
01:53 AM	Vitals
01:53 AM	Treatment
01:53 AM	Vitals
01:53 AM	Vitals
01:54 AM	Treatment
01:54 AM	Vitals
01:54 AM	Vitals
02:16 AM	Vitals
02:33 AM	Vitals
02:39 AM	Treatment
02:39 AM	Vitals

B6

B6

Client: **B6**
Patient:

Patient History

02:39 AM	Vitals
03:36 AM	Treatment
03:36 AM	Vitals
03:36 AM	Vitals
03:41 AM	Treatment
03:41 AM	Vitals
03:41 AM	Treatment
03:41 AM	Vitals
04:49 AM	Treatment
04:49 AM	Vitals
04:49 AM	Vitals
04:49 AM	Treatment
04:49 AM	Vitals
05:25 AM	Treatment
05:28 AM	Treatment
05:28 AM	Vitals
05:29 AM	Treatment
05:29 AM	Vitals
05:29 AM	Vitals
05:29 AM	Treatment
05:36 AM	Treatment
05:36 AM	Vitals
05:36 AM	Treatment
05:56 AM	Treatment
05:56 AM	Vitals
05:56 AM	Vitals
06:56 AM	Treatment
06:56 AM	Vitals
06:56 AM	Vitals
06:56 AM	Treatment
06:56 AM	Vitals
07:37 AM	Treatment
07:37 AM	Vitals
07:37 AM	Treatment
07:37 AM	Vitals
07:38 AM	Treatment
07:58 AM	Treatment
07:58 AM	Vitals
07:58 AM	Vitals
07:59 AM	Treatment

B6

B6

Client: **B6**
Patient:

Patient History

07:59 AM	Vitals
09:02 AM	Treatment
09:05 AM	Prescription
09:09 AM	Treatment
09:09 AM	Vitals
09:09 AM	Vitals
09:12 AM	Treatment
09:27 AM	Deleted Reason
09:29 AM	Purchase
09:29 AM	Treatment
09:33 AM	Treatment
09:33 AM	Vitals
09:46 AM	Treatment
09:56 AM	Purchase
10:02 AM	Treatment
10:02 AM	Vitals
10:02 AM	Vitals
10:05 AM	Treatment
10:05 AM	Vitals
10:05 AM	Treatment
10:05 AM	Vitals
10:05 AM	Vitals
10:06 AM	Treatment
11:06 AM	Treatment
11:06 AM	Vitals
11:06 AM	Vitals
11:07 AM	Treatment
11:07 AM	Vitals
11:27 AM	Treatment
11:27 AM	Vitals
11:27 AM	Treatment
11:27 AM	Vitals
11:53 AM	UserForm
12:02 PM	Purchase
12:02 PM	Purchase
12:23 PM	Treatment
12:23 PM	Vitals
12:23 PM	Vitals
12:26 PM	Treatment

B6

B6

Client: **B6**
Patient:

Patient History

12:26 PM	Vitals
01:04 PM	Treatment
01:04 PM	Vitals
01:04 PM	Vitals
01:05 PM	Treatment
01:05 PM	Vitals
01:05 PM	Treatment
01:20 PM	Treatment
01:20 PM	Vitals
01:55 PM	Treatment
01:55 PM	Vitals
01:55 PM	Vitals
01:55 PM	Vitals
01:55 PM	Treatment
01:55 PM	Vitals
02:52 PM	Treatment
02:52 PM	Vitals
02:52 PM	Vitals
02:53 PM	Treatment
02:53 PM	Vitals
03:12 PM	Treatment
03:12 PM	Vitals
03:50 PM	Treatment
03:50 PM	Vitals
03:50 PM	Treatment
03:50 PM	Vitals
03:50 PM	Vitals
04:49 PM	Treatment
04:49 PM	Vitals
04:54 PM	Treatment
04:54 PM	Vitals
04:54 PM	Vitals
05:16 PM	Treatment
05:22 PM	Treatment
05:22 PM	Treatment
05:22 PM	Vitals
05:28 PM	Treatment
05:29 PM	Treatment
05:33 PM	Treatment
05:33 PM	Vitals
05:46 PM	Treatment

B6

B6

Client: **B6**
Patient:

Patient History

05:46 PM	Vitals
05:46 PM	Treatment
05:46 PM	Vitals
05:46 PM	Vitals
06:00 PM	Vitals
06:20 PM	Vitals
06:21 PM	Treatment
06:21 PM	Treatment
06:30 PM	Vitals
06:45 PM	Treatment
06:51 PM	Treatment
07:00 PM	Vitals
07:00 PM	Vitals
07:08 PM	Treatment
07:08 PM	Treatment
07:08 PM	Vitals
08:00 PM	Vitals
08:07 PM	Treatment
08:07 PM	Vitals
08:07 PM	Vitals
08:08 PM	Treatment
08:08 PM	Vitals
09:00 PM	Vitals
09:00 PM	Vitals
09:06 PM	Treatment
09:06 PM	Vitals
09:14 PM	Treatment
09:17 PM	Treatment
09:17 PM	Vitals
09:18 PM	Treatment
09:36 PM	Treatment
09:36 PM	Treatment
09:36 PM	Vitals
09:40 PM	Treatment
09:40 PM	Vitals
09:41 PM	Treatment
09:41 PM	Vitals
09:41 PM	Vitals
11:21 PM	Treatment
11:21 PM	Vitals
11:21 PM	Vitals

B6

B6

Client: **B6**
Patient: **B6**

Patient History

11:22 PM	Treatment
11:22 PM	Vitals
11:24 PM	Treatment
11:24 PM	Vitals
11:27 PM	Vitals
12:00 AM	Purchase
12:10 AM	Treatment
12:10 AM	Vitals
12:10 AM	Vitals
12:10 AM	Treatment
12:10 AM	Vitals
01:02 AM	Treatment
01:02 AM	Treatment
01:02 AM	Vitals
01:03 AM	Treatment
01:03 AM	Vitals
01:03 AM	Vitals
01:04 AM	Treatment
01:04 AM	Vitals
01:05 AM	Vitals
01:22 AM	Treatment
01:22 AM	Vitals
01:22 AM	Treatment
01:22 AM	Vitals
01:22 AM	Vitals
01:57 AM	Vitals
01:58 AM	Treatment
02:00 AM	Treatment
02:00 AM	Vitals
02:00 AM	Vitals
02:59 AM	Treatment
02:59 AM	Vitals
02:59 AM	Vitals
03:03 AM	Treatment
03:03 AM	Vitals
03:04 AM	Vitals
03:51 AM	Treatment
03:51 AM	Vitals
03:58 AM	Treatment
03:58 AM	Vitals
03:58 AM	Vitals
03:58 AM	Vitals
04:58 AM	Treatment

B6

B6

Client: **B6**
Patient:

Patient History

04:58 AM	Treatment
04:58 AM	Treatment
04:58 AM	Vitals
04:59 AM	Treatment
04:59 AM	Treatment
05:06 AM	Treatment
05:06 AM	Vitals
05:06 AM	Treatment
05:06 AM	Vitals
05:06 AM	Treatment
05:06 AM	Vitals
05:08 AM	Treatment
05:08 AM	Vitals
05:08 AM	Vitals
05:08 AM	Treatment
05:08 AM	Vitals
05:14 AM	Treatment
05:14 AM	Vitals
05:48 AM	Treatment
05:48 AM	Vitals
05:48 AM	Vitals
05:48 AM	Treatment
05:48 AM	Vitals
06:48 AM	Treatment
06:48 AM	Vitals
06:48 AM	Vitals
06:49 AM	Treatment
06:49 AM	Vitals
07:40 AM	Vitals
08:00 AM	Treatment
08:00 AM	Vitals
08:00 AM	Vitals
08:01 AM	Treatment
08:01 AM	Vitals
09:04 AM	Treatment
09:04 AM	Vitals
09:05 AM	Treatment
09:10 AM	Treatment
09:10 AM	Vitals
09:10 AM	Vitals
09:53 AM	Treatment

B6

B6

Client:
Patient:

B6

Patient History

09:53 AM	Vitals
09:53 AM	Vitals
10:00 AM	Treatment
10:00 AM	Vitals
10:00 AM	Treatment
10:01 AM	Vitals
10:01 AM	Treatment
10:01 AM	Treatment
10:01 AM	Vitals
10:02 AM	Vitals
10:24 AM	Purchase
11:05 AM	Treatment
11:05 AM	Vitals
11:06 AM	Treatment
11:06 AM	Vitals
11:06 AM	Vitals
11:31 AM	Treatment
11:31 AM	Vitals
12:02 PM	Purchase
12:02 PM	Purchase
12:11 PM	Treatment
12:11 PM	Vitals
12:11 PM	Vitals
12:13 PM	Treatment
12:13 PM	Vitals
12:17 PM	Treatment
12:18 PM	Purchase
12:54 PM	Treatment
12:55 PM	Treatment
12:55 PM	Vitals
12:55 PM	Treatment
12:55 PM	Vitals
12:55 PM	Vitals
12:59 PM	Treatment
12:59 PM	Vitals
12:59 PM	Treatment
12:59 PM	Vitals
01:49 PM	Treatment
01:49 PM	Vitals
01:50 PM	Treatment
01:50 PM	Vitals

B6

B6

Client:
Patient:

B6

Patient History

01:50 PM	Vitals
03:10 PM	Treatment
03:10 PM	Vitals
03:11 PM	Treatment
03:11 PM	Vitals
03:11 PM	Vitals
04:04 PM	Treatment
04:04 PM	Vitals
04:04 PM	Vitals
04:04 PM	Treatment
04:04 PM	Vitals
05:04 PM	Treatment
05:04 PM	Vitals
05:04 PM	Vitals
05:04 PM	Treatment
05:04 PM	Vitals
05:07 PM	Treatment
05:11 PM	Treatment
05:11 PM	Vitals
05:19 PM	Treatment
05:19 PM	Vitals
05:24 PM	Prescription
05:24 PM	Prescription
05:31 PM	Treatment
05:31 PM	Treatment
05:31 PM	Vitals
05:35 PM	Treatment
05:35 PM	Vitals
05:57 PM	Treatment
05:57 PM	Vitals
05:57 PM	Vitals
05:57 PM	Treatment
05:57 PM	Vitals
07:23 PM	Treatment
07:23 PM	Vitals
07:23 PM	Vitals
07:24 PM	Treatment
07:24 PM	Vitals
07:56 PM	Treatment
07:56 PM	Vitals

B6

B6

Client: **B6**
Patient:

Patient History

07:56 PM	Vitals
07:56 PM	Treatment
07:56 PM	Vitals
08:11 PM	Vitals
08:11 PM	Vitals
08:46 PM	Treatment
08:46 PM	Vitals
09:17 PM	Treatment
09:17 PM	Treatment
09:17 PM	Vitals
09:17 PM	Vitals
09:17 PM	Treatment
09:18 PM	Treatment
09:18 PM	Vitals
09:18 PM	Vitals
09:19 PM	Treatment
09:19 PM	Vitals
09:23 PM	Vitals
09:24 PM	Treatment
09:24 PM	Vitals
09:53 PM	Treatment
09:53 PM	Vitals
09:53 PM	Vitals
09:53 PM	Treatment
09:53 PM	Vitals
11:08 PM	Treatment
11:08 PM	Vitals
11:08 PM	Vitals
11:08 PM	Treatment
11:08 PM	Vitals
11:09 PM	Treatment
11:09 PM	Vitals
12:00 AM	Purchase
12:11 AM	Treatment
12:11 AM	Vitals
12:11 AM	Vitals
12:12 AM	Treatment
12:12 AM	Vitals
12:50 AM	Treatment
12:50 AM	Vitals
12:50 AM	Vitals
12:50 AM	Treatment
12:50 AM	Vitals

B6

B6

Client:
Patient:

B6

Patient History

12:50 AM	Treatment
12:50 AM	Treatment
12:50 AM	Vitals
02:11 AM	Treatment
02:11 AM	Vitals
02:11 AM	Vitals
02:12 AM	Treatment
02:12 AM	Vitals
02:15 AM	Treatment
02:15 AM	Vitals
03:09 AM	Treatment
03:09 AM	Vitals
03:09 AM	Vitals
03:09 AM	Treatment
03:09 AM	Vitals
04:42 AM	Treatment
04:42 AM	Vitals
04:42 AM	Vitals
04:42 AM	Treatment
04:42 AM	Vitals
05:32 AM	Treatment
05:32 AM	Vitals
05:32 AM	Treatment
05:32 AM	Vitals
05:32 AM	Treatment
05:32 AM	Vitals
05:32 AM	Vitals
05:33 AM	Treatment
05:35 AM	Treatment
05:35 AM	Treatment
05:41 AM	Treatment
05:41 AM	Vitals
05:41 AM	Treatment
05:41 AM	Vitals
05:45 AM	Treatment
05:45 AM	Vitals
05:45 AM	Treatment
05:45 AM	Vitals
05:58 AM	Treatment
05:58 AM	Vitals
05:58 AM	Vitals
05:59 AM	Treatment

B6

B6

Client:
Patient:

B6

Patient History

05:59 AM	Vitals
07:26 AM	Treatment
07:26 AM	Vitals
07:28 AM	Treatment
07:28 AM	Vitals
07:28 AM	Vitals
07:52 AM	Treatment
07:52 AM	Vitals
07:52 AM	Vitals
07:54 AM	Treatment
07:54 AM	Vitals
08:32 AM	Deleted Reason
08:33 AM	Purchase
09:01 AM	Treatment
09:01 AM	Vitals
09:01 AM	Vitals
09:09 AM	Treatment
09:09 AM	Vitals
09:22 AM	Treatment
09:22 AM	Vitals
09:43 AM	Treatment
10:03 AM	Treatment
10:03 AM	Vitals
10:03 AM	Vitals
10:21 AM	Treatment
10:21 AM	Vitals
10:22 AM	Treatment
10:22 AM	Vitals
10:22 AM	Treatment
10:25 AM	Vitals
10:26 AM	Treatment
10:51 AM	Treatment
10:51 AM	Vitals
10:51 AM	Vitals
10:57 AM	Treatment
10:57 AM	Vitals
12:02 PM	Purchase
12:02 PM	Purchase
12:02 PM	Treatment
12:03 PM	Vitals
12:03 PM	Vitals

B6

B6

Client: **B6**
Patient:

Patient History

2:03 PM	Treatment
2:03 PM	Vitals
2:59 PM	Treatment
2:59 PM	Vitals
2:59 PM	Vitals
2:59 PM	Treatment
01:00 PM	Treatment
01:00 PM	Vitals
01:06 PM	Treatment
01:06 PM	Vitals
01:07 PM	Treatment
01:07 PM	Vitals
01:19 PM	Prescription
01:33 PM	Purchase
01:33 PM	Treatment
01:58 PM	Treatment
01:58 PM	Vitals
01:58 PM	Vitals
01:59 PM	Treatment
01:59 PM	Vitals
02:49 PM	Treatment
02:49 PM	Vitals
02:49 PM	Vitals
02:49 PM	Treatment
02:49 PM	Vitals
03:40 PM	Prescription
03:40 PM	Prescription
03:41 PM	Prescription
03:41 PM	Prescription
03:47 PM	Treatment
03:47 PM	Vitals
03:47 PM	Vitals
03:47 PM	Treatment
03:47 PM	Vitals
03:53 PM	Purchase
04:34 PM	UserForm

B6

B6

B6

B6

Male (Neutered)

Canine Boxer Brindle

Patient ID: **B6**

STANDARD CONSENT FORM

I am the owner, or agent for the owner, of the above described animal and have the authority to execute consent. I hereby authorize the Cummings School of Veterinary Medicine at Tufts University (herein after Cummings School) to prescribe for treatment of said animal according to the following terms and conditions.

Cummings School and its officers, agents and employees will provide such veterinary medical care as they deem reasonable and appropriate under the circumstances.

Cummings School and its officers, agents, and employees will use all reasonable care in the treatment of the above mentioned animal, but will not be liable for any loss or accident that may occur or any disease that may develop as a result of the care and treatment provided.

I understand that the above identified animal may be treated by Cummings School students under the supervision and assistance of Cummings School staff members.

In executing this form, I hereby expressly acknowledge that risks, benefits and alternative forms of treatment have been explained to me. I understand said explanation, and I consent to treatment. Should any additional treatments or diagnostics be required during the continued care of my animal, I understand that I will be given the opportunity to discuss and consent to these additional procedures. I understand that further or additional treatment may be required without an opportunity for discussion and consideration by me, in the case of the development of any life-threatening emergency during the continued care of my animal and I expressly consent to all such reasonable treatment as required. I realize and understand that results cannot be guaranteed.

If any equipment is left with the animal, it will be accepted with the understanding that Cummings School assumes no responsibility for any loss of equipment that may occur.

I agree to pick up the animal when notified that it is ready for release.

In the event the animal is not picked up, and if ten (10) days have expired since a registered letter was sent to the address given above, notifying me to call for the animal, the animal may be sold or otherwise disposed of in a humane manner and the proceeds applied to the charges incurred in caring and treating the animal. Failure to remove said animal will not and does not relieve me from obligation for the costs of services rendered.

I hereby grant to the Cummings School of Veterinary Medicine at Tufts University, its officers and employees (collectively referred to herein as Cummings School), and its agents and assigns (the Grantees) the irrevocable rights to photograph / videotape the operation or procedure to be performed, including appropriate and otherwise use such photographs and images for, and in connection with, a Grantee's medical, scientific, educational, and publicity purposes, by any means, methods and media (print and electronic) now known or, in the future, developed that the Grantee deems appropriate (provided that such photographs and images may not be used in for-profit commercials, unless such commercials are publicizing educational programs at Cummings School). As medical and surgical treatment necessitates the removal of tissue, cells, fluids or body parts of my animal, I authorize the Grantees to dispose of or use these tissues, cells, fluids or body parts for scientific and educational purposes.

I understand that a FINANCE CHARGE will be applied to all accounts unpaid after 30 days. The FINANCE CHARGE is computed on a monthly rate of 1.33% per month, which is an annual percentage rate of 16% applied to the average daily balance outstanding, with a minimum fee of \$.50.

I do further agree that should any payment, or the full amount of the sum stated above, become overdue more than 20 days from the above-agreed upon time of payment or payments, the entire balance shall be considered in default and become due and payable. I further agree to be responsible for any or all collection agency and/or attorney fees necessary to collect the full amount.

I do further agree to comply with hours of visitation in conjunction with our Hospital's policy.

I have read, understand, and agree to accept the terms and conditions herein.

Owner's name: Date:

Owner's address:

If the individual admitting the animal is someone other than the legal owner, please complete the portion below:

The owner of the animal has granted me authority to obtain medical treatment and to bind this owner to pay the veterinary medical services provided at Cummings School pursuant to the terms and conditions described above

Authorized Agent - Please Print

Agent's Signature

Street Address

Date

Town/City State Zip

Treatment Plan

Estimated Charges

B6

B6

This estimate is based upon our preliminary examination. This is an estimate and is not the final bill. Every effort will be made to keep you informed of the current status of your bill throughout your animal's hospitalization. The final fee may vary considerably from this estimated cost.

Patient	Description	Low Qty	Low Extended	High Qty	High Extended
B6	B6			B6	

Doctor of Record

B6

B6

I understand that no guarantee of successful treatment is made. I certify that I have read and fully understand the authorization for medical and/or surgical treatment, the reason for why such medical and/or surgical treatment is considered necessary, as well as its advantages and possible complications, if any. I also assume financial responsibility for all charges incurred to this patient(s). I agree to pay 75% of the estimated cost at the time of admission. Additional deposits will be required if additional care or procedures are required. I further agree to pay the balance of the charges when this patient(s) is released.

Procedural billing is inclusive up to and including the estimated duration of hospitalization. There will be additional expenses if hospitalization extends beyond the specified duration. I have read, understand, and agree to accept the conditions of this treatment plan.

Thank you for entrusting us with your pet's care.

High Total	B6
Low Total	
75% Deposit	

Radiology Request & Report

Patient

Name: B6
Species: Canine
Breed: Male (Neutered) Boxer
Birthdate: B6

Owner

Name: B6
Address: B6

Patient ID: B6
Date of re: B6

Attending Clinician: B6

Student:

Date of exam: B6

Patient Location: Ward/Cage:

Weight(lbs) 0.00

- Inpatient
- Outpatient Time:
- Waiting
- Emergency

Sedation

- BAG
- OBAG
- 1/2 dose OBAG
- DexDomitor/Butorphanol
- Anesthesia to sedate/anesthetize

Examination Desired:

3 view chest

Presenting Complaint and Clinical Questions you wish to answer:

Emergency

Pertinent History:

Arrhythmia

FROM SOAP: "owner has been gone for a week, B6 was at home with husband. In July primary vet noticed heart arrhythmia due to symptom of wheezing. rDMM Started on B6 owners gave that for a couple weeks and wheezing resolved, stopped B6 1 week ago started wheezing again (sporadic), became clingy and lethargic. No vomiting/heaving, drinking water, didn't finish food this morning which is abnormal. unknown diarrhea, appetite status while owner was gone. Did restart B6 on Tuesday."

Findings:

THORAX, THREE VIEWS.

B6

B6

B6

Conclusions:

- Cardiopulmonary changes are consistent with left-sided congestive heart failure. Given moderate generalized cardiomegaly and moderate left atrial enlargement, consider DCM given breed. Echocardiography is recommended and repeat thoracic radiographs to monitor response to therapy.
- Impression of faint rounded soft tissue opacities mixed in with the interstitial pattern may represent peribronchial cuffing and end on vessels, pulmonary nodules are thought less likely. Follow-up radiographs to reassess the lungs are recommended after resolution of cardiogenic pulmonary edema.
- Concurrent mild diffuse bronchial pattern likely represents a component of lower airway disease.

Radiologists

Primary: , DVM

Reviewing:

Dates

Reported:

Finalized:

Discharge Instructions

Patient

Name: B6
Signalment: B6 Years Old Brindle Male (Neutered) Boxer

Owner

Name:
Address:

B6

Patient ID: B6
Emergency Clinician: B6 DVM
Consulting Clinician: B6 DVM

ER Supervisor:

B6

Admit Date: B6 9:12:55 AM
Check Out Date: B6

Diagnosis:

1. Dilated cardiomyopathy (DCM) with congestive heart failure
2. Malignant ventricular arrhythmia

Case Summary:

B6 has been diagnosed with a primary heart muscle disease called dilated cardiomyopathy (DCM). This disease is more common in large and giant breed dogs and is characterized by thinning of the walls of the heart, reduced cardiac pump function, and enlargement of the upper chambers of the heart. Many dogs with DCM will also have significant arrhythmias (like B6) which can be life-threatening and also require medical management. The heart enlargement has now progressed to the point of congestive heart failure, meaning that fluid is backing up into the lungs or belly. Unfortunately this is a progressive disease and we cannot reverse the changes to the heart muscle, however we can use cardiac medications and some changes to the diet to make your dog comfortable and have him breathing easier.

Diagnostic test results and findings:

- o
- o
- o
- o

B6

History:

B6 presented to Tufts ER on B6 for further evaluation of a one week history of wheezing. You report that your family vet noted a heart arrhythmia in July (was evaluated for wheezing) and B6 was started on B6. The wheezing resolved and the medication was discontinued. B6 didn't finish his breakfast the morning before presentation to ER, and this is abnormal for him.

Physical exam:

On presentation, B6 was bright and alert and his vital were normal except an elevated heart rate B6. He was noted to have a grade 2-3/6 heart murmur and an arrhythmia. He had moderate respiratory difficulty, and some wheezing and

coughing was noted intermittently. The rest of his physical exam was unremarkable.

Diagnostic/Treatment plan:

B6 had x-rays of his chest that showed evidence of left sided congestive heart failure and a moderate cardiomegaly (enlarged heart). He also had an echocardiogram which showed findings consistent with dilated cardiomyopathy (poor contractile function of the heart), active congestive heart failure, and frequent ventricular arrhythmia. B6 also had bloodwork which showed mild elevations in one of his liver values (ALT). On re-check bloodwork the next day, the liver value (ALT) was improved by still elevated. His kidney values also increased slightly, suspect due to the B6

While in the hospital, B6 was closely monitored with a continuous EKG, and he was given several medications to treat his conditions, including B6 (first night), B6 taurine, B6 and later B6 after stopping B6

Monitoring at home:

1. Please monitor for any signs of lethargy, weakness, pale gums, cough, shortness of breath, inappetence, or collapse. If a collapsing episode is noted, please check your dog's gum color and try to get a sense of whether the heart rate is slow or fast. If you have an iPhone or Android smartphone device, you may want to explore the option of purchasing the Kardia device (www.alivacor.com or search 'Kardia' on www.amazon.com). If you have an iPhone, download the 'Veterinary Alive' app. If you have an Android device, download the 'Kardia' app. Both are free to download. This will allow you to monitor the heart rate and rhythm at home. If you have any concerns, please call or have your dog evaluated by a veterinarian. Our emergency clinic is open 24 hours/day.

2. We would like you to monitor your dog's breathing rate and effort at home, ideally during sleep or at a time of rest. The doses of drugs will be adjusted based on the breathing rate and effort. In general, most dogs with heart failure that is well controlled have a breathing rate at rest of less than 35 to 40 breaths per minute. In addition, the breathing effort, noted by the amount of belly wall motion used for each breath, is fairly minimal if heart failure is controlled. An increase in breathing rate or effort will usually mean that you should give an extra dose of B6 if difficulty breathing is not improved by within 30-60 minutes after giving extra B6 then we recommend that a recheck exam be scheduled and/or that your dog be evaluated by an emergency clinic. There are instructions for monitoring breathing, and a form to help keep track of breathing rate and drug doses, on the Tufts HeartSmart web site (<http://vet.tufts.edu/heartsmart/at-home-monitoring/>).

Recommended Medications:

B6

Diet suggestions:

Dogs with arrhythmia may benefit from the addition of omega-3 fatty acids (fish oil) to the diet. Diets such as the Royal Canin Boxer or Early Cardiac diet or Hill's j/d have ample fish oil and may not require much (or any) additional supplementation.

Dogs with heart failure accumulate more fluid in their body if they eat large amounts of sodium (salt). Sodium can be found in all foods, but some foods are lower in sodium than others.

Many pet treats, people foods, and supplements used to give pills often have more sodium than is desirable - a sheet that has suggestions for low sodium treats can be found on the HeartSmart web site (<http://vet.tufts.edu/heartsmart/diet/>). You can also find additional information on supplements such as fish oil or other supplements that you might have questions about may be found on the Tufts HeartSmart web site: (<http://vet.tufts.edu/heartsmart/diet/>).

- The FDA is currently investigating an apparent association between diet and a type of heart disease called dilated cardiomyopathy. The exact cause is still unclear, but it appears to be associated with boutique diets and those containing exotic ingredient or are grain-free. Therefore, we are currently recommending that dogs do not eat these types of diets.
- We recommend switching B6 to commercial diet made by a well-established company that is not grain-free and does not contain any exotic ingredients, such as kangaroo, duck, lamb, venison, lentils, peas, beans, buffalo, tapioca, barley, and chickpeas.
- The FDA issued a statement regarding this issue (<https://www.fda.gov/AnimalVeterinary/NewsEvents/CVMUpdates/ucm613305.htm>) and a recent article published by Dr. Lisa Freeman on the Cummings School's PetFoodology blog can further explain these findings (<http://vetnutrition.tufts.edu/2018/06/a-broken-heart-risk-of-heart-disease-in-boutique-or-grain-free-diets-and-exotic-ingredients/>).
- Our nutritionists have compiled a list of dog foods that are good options for dogs with heart disease.

Dry Food Options:

Royal Canin Early Cardiac (veterinary diet)

Royal Canin Boxer

Purina Pro Plan Adult Weight Management

Purina Pro Plan Bright Mind Adult Small Breed Formula

Canned Food Options:

Hill's ScienceDiet Adult Beef and Barley Entree

Hill's Science Diet Adult 1-6 Healthy Cuisine Roasted Chicken, Carrot, and Spinach Stew

Royal Canin Mature 8+

We recommend slowly introducing one of the diets on the above list as follows: 25% of the new diet mixed with 75% old diet for 2-3 days, then 50:50, etc.

Hopefully you can find a diet on the list that B6 will enjoy!

If your dog has special nutritional needs or requires a homecooked diet, we recommend you schedule an appointment with our nutritionists (508-887-4696).

Exercise recommendations:

For the first 7 to 10 days after starting anti-arrhythmic medications and medications for heart failure, and until we know that the medications are effectively controlling arrhythmia, we recommend very limited activity. Leash walk only is ideal, and short walks to start. Once the arrhythmia and heart failure has been well controlled then slightly longer walks are acceptable. However, repetitive or strenuous high-energy activities (repetitive ball chasing, running fast off-leash, etc.) are not recommended as these activities may result in worsened arrhythmia or even sudden death.

Recheck/Follow-up:

A recheck exam is usually recommended in 7 to 14 days to check and see if the arrhythmia and heart failure is well controlled. If you wish to have the Cardiology service at Tufts assist with ongoing care of your pet's heart disease, please contact the Cardiology service by sending an email to cardiovet@tufts.edu within 24-48 hours after your pet has been discharged to set up an appointment. After you have made an appointment with the Cardiology service, the Cardiology service will then be able to answer questions regarding the care of your pet. If instead you would like to continue care with

your primary care veterinarian, then please have your veterinarian contact us with any questions regarding the treatment of your pet. As always, if your pet again encounters an emergency, the Emergency Service is available to see you 24 hours a day, 365 days a year.

Thank you for entrusting us with B6 care. Please contact our Cardiology liaison at (508)-887-4696 or email us at cardiovet@unh.edu for scheduling and non-emergent questions or concerns. Our emergency clinic is also open 24 hours/day.

Thank you for entrusting us with B6 care. He is such a sweet boy!

Cummings Veterinary Medical Center

AT TUFTS UNIVERSITY
Cardiology Liaison: 508-887-4696

B6

Patient ID: B6

B6

Canine

Years Old Male (Neutered) Boxer
Brindle BW: Weight(lbs) 0.00

Cardiology Inpatient ENROLLED IN DCM DIET STUDY

Date: B6)

Weight: Weight(lbs) 25kg

Attending Cardiologist:

John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6

Thoracic radiographs available for review?

- Yes - in SS
 Yes - in PACS
 No

Patient location:

ER

Presenting complaint and important concurrent diseases:

Previously diagnosed arrhythmia at rDVM in July, was started on B6 but discontinued after a few weeks due to resolution of symptoms (wheezing). Owner reports that while she was away last week his wheezing returned. Owner started B6 again last Tuesday. Now lethargic, decreased appetite. No other significant history.

Current medications and doses:

B6

At-home diet: (name, form, amount, frequency)

Royal canin boxer dry

Key indication for consultation: (murmur, arrhythmia, needs fluids, etc.)

Historical arrhythmia

Questions to be answered:

Does he have current heart disease/heart failure? degree of arrhythmia?

Is your consult time-sensitive? (e.g., anesthesia today, owner waiting, trying to get biopsy today)

- Yes (explain):
- No, owner waiting in lobby

STOP - remainder of form to be filled out by Cardiology

Physical Examination

B6

Muscle condition:

- Normal
- Moderate cachexia
- Mild muscle loss
- Marked cachexia

Cardiovascular Physical Exam

Murmur Grade:

- None
- IV/VI
- I/VI
- V/VI
- II/VI to
- VI/VI
- III/VI

Murmur location/description: left, apical, systolic

Jugular vein:

- Bottom 1/3 of the neck
- Top 2/3 of the neck
- Middle 1/3 of the neck
- 1/2 way up the neck

Arterial pulses:

- Weak
- Bounding
- Fair
- Pulse deficits
- Good
- Pulsus paradoxus
- Strong
- Other (describe):

Arrhythmia:

- None
- Bradycardia
- Sinus arrhythmia
- Tachycardia
- Premature beats

Gallop:

- Yes
- Pronounced
- No
- Other:
- Intermittent

Pulmonary assessments:

- Eupneic
- Pulmonary Crackles
- Moderate dyspnea
- Wheezes
- Marked dyspnea
- Upper airway stridor
- Normal BV sounds
- Other auscultatory findings: Cough

Abdominal exam:

- Normal
- Abdominal distension

Hepatomegaly

Mild ascites

Echocardiogram Findings:

General/2-D findings: **Abbreviated echocardiogram due to dyspnea**

B6

Doppler findings:

B6

ECG findings:

B6

Radiographic findings:

B6

Assessment and recommendations:

Findings consistent with DCM with active CHF and frequent ventricular arrhythmia. Patient has enough malignant arrhythmia that hospitalization and **B6** and telemetry monitoring is recommended. **B6** is recommended for the day and depending how well he responds, maybe we can decrease to q6-8h overnight. Patient has historically been on grain free diet for years before been switched to current diet. It is unclear whether this is a primary DCM, ARVC with DCM phenotype, or diet-induced cardiomyopathy, but **B6** and **B6** are also recommended. Apparently patient tolerated well **B6** in the past, but we generally avoid it at this point due to potential beta-blocker effects that may worsen systolic function. Thus, recommend bloodwork and if liver values are normal, **B6** (decreasing to SID after 5 days) should be started. However since he tolerated it in the past, otalol could be considered once CHF is resolved if liver values are elevated. **B6** may also be effective helping decrease ventricular arrhythmia density. Recommend addition of ar **B6** when patient is eating and not azotemic. Recommend repeat echocardiogram in 3 months or sooner in case patient develops clinical signs consistent with progression of the disease (shortness breath, collapse, syncope, exercise intolerance, pale mucous membrane). Client can be instructed on how to use AliveCor and assess heart rate and rhythm from home if patient at rest and calm at home.

Addendum **B6**

The patient continues to have persistent ventricular tachycardia despite being on the **B6** for almost 3 days. It was elected to add **B6**. The owner elected to take the patient home today despite poor arrhythmia controlled. Recheck ECG is recommended in 7-10 days.

Treatment Plan:

B6

Final Diagnosis:

Severe cardiomegaly with poor contractile function - r/o primary DCM, diet-induced cardiomyopathy, ARVC, tachycardiac induced cardiomyopathy.

Malignant ventricular arrhythmia - non-sustained VTach and frequent polymorphic VPCs;

Left sided congestive heart failure.

Heart Failure Classification Score:

ISACHC Classification:

- Ia
- Ib
- II
- IIIa
- IIIb

ACVIM CHF Classification:

- A
- B1
- B2
- C
- D

M-Mode

IVSd

LVIDd

LVPWd

IVSs

LVIDs

LVPWs

EDV(Teich)

ESV(Teich)

EF(Teich)

%FS

SV(Teich)

M-Mode Normalized

IVSdN

LVIDdN

LVPWdN

B6

cm
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%
%
ml

{0.290 - 0.520}
{1.350 - 1.730}!
{0.330 - 0.530}

IVSsN
LVIDsN
LVPWsN

2D
SA LA
Ao Diam
SA LA / Ao Diam
IVSd
LVIDd
LVPWd
EDV(Teich)
IVSs
LVIDs
LVPWs
ESV(Teich)
EF(Teich)
%FS
SV(Teich)
LVld LAX
LVAd LAX
LVEDV A-L LAX
LVEDV MOD LAX
LVls LAX
LVAs LAX
LVESV A-L LAX
LVESV MOD LAX
HR
EF A-L LAX
LVEF MOD LAX
SV A-L LAX
SV MOD LAX
CO A-L LAX
CO MOD LAX

Doppler
MR Vmax
MR maxPG
PV Vmax
PV maxPG

B6

{0.430 - 0.710} !
{0.790 - 1.140} !
{0.530 - 0.780} !

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l/min

m/s
mmHg
m/s
mmHg

Cardiology Liaison: 508-887-4696

Foster Hospital for Small Animals
55 Willard Street
North Grafton, MA 01536
Telephone (508) 839-5395
Fax (508) 839-7951
<http://vetmed.tufts.edu/>

Discharge Instructions

Patient

Name: B6

Species: Canine

Breed: Male (Neutered) Boxer

Birthdate: B6

Owner

Name: B6

Address: B6

Patient ID: B6

Attending Cardiologist:

John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6

Cardiology Technician:

B6

Student:

Admit Date: B6 9:12:55 AM

Discharge Date: B6

Diagnoses:

- Suspected Arrhythmogenic right ventricular cardiomyopathy (ARVC) versus Dilated cardiomyopathy
- Active Congestive heart failure
- Ventricular arrhythmia - Not currently controlled -

Clinical findings:

Thank you for bringing B6 to Tufts University.

He presented to our ER last Friday after it was noticed that he had a decreased appetite and overall was not feeling like his normal self. He was previously diagnosed with an arrhythmia (irregular heart rate) back in July by your primary care veterinarian but had never been seen by a cardiologist.

Upon presentation to the ER, B6 was noticed to have increased respiratory effort and rate in addition to a non-productive cough. Also, his heart rate was faster than normal and he had very frequent irregular premature beats. Chest radiographs were then performed and were suspicious for accumulation of fluid within the lungs, a condition consistent with active congestive heart failure.

B6 was then seen by the Cardiology department where an echocardiogram (ultrasound of the heart) was performed.

B6 has been diagnosed with a primary heart muscle disease called arrhythmogenic right ventricular cardiomyopathy (ARVC). This disease is common in Boxers and bulldogs and is also sometimes referred to as "Boxer Cardiomyopathy". The condition is characterized by replacement of the normal heart muscle by fat and/or scar tissue which may result in serious ventricular arrhythmias (abnormal heart rhythms originating from the lower chamber of the heart), cardiac enlargement

and congestive heart failure, or both. Dogs with ARVC may experience syncope (fainting) or sudden death as the result of ventricular arrhythmia.

As we discussed over the phone, another possibility to explain the changes within B6's heart is a type of heart disease called dilated cardiomyopathy (DCM). This disease is more common in large and giant breed dogs and is characterized by thinning of the walls of the heart, reduced cardiac pump function, and enlargement of the upper chambers of the heart. Many dogs with DCM will also have significant arrhythmias which can be life-threatening and also require medical management.

B6 was then admitted to the hospital for further monitoring and management of his cardiac disease. Over the course of his stay in the hospital, it was noted that B6's respiratory rate and effort progressively improved to the point of being back to normal today. However, his arrhythmia is fairly resistant to our current treatment. However, as we discussed every dog is different and require a different antiarrhythmic management at home. At this point of time, we are trying a new combination of medications with the hope that this will decrease the frequency of his arrhythmia.

Though we cannot reverse the changes in the heart muscle, we can control the arrhythmias with medical management and dogs without serious cardiac dilation can do well for months to even years after diagnosis with appropriate therapy and careful monitoring.

Monitoring at home:

- We would like you to monitor your dog's breathing rate and effort at home, ideally during sleep or at a time of rest. The doses of drugs will be adjusted based on the breathing rate and effort.
- In general, most dogs with heart failure that is well controlled have a breathing rate at rest of less than 35 to 40 breaths per minute. In addition, the breathing effort, noted by the amount of belly wall motion used for each breath, is fairly minimal if heart failure is controlled.
- An increase in breathing rate or effort will usually mean that you should give an extra dose of B6 if difficulty breathing is not improved by within 30-60 minutes after giving extra B6; then we recommend that a recheck exam be scheduled and/or that your dog be evaluated by an emergency clinic.
- There are instructions for monitoring breathing, and a form to help keep track of breathing rate and drug doses, on the Tufts HeartSmart web site (<http://vet.tufts.edu/heartsmart/at-home-monitoring/>).
- We also want you to watch for weakness or collapse, a reduction in appetite, worsening cough, or distention of the belly as these findings indicate that we should do a recheck examination.
- If you have an iPhone or Android smartphone device, you may want to explore the option of purchasing the Kardia Mobile device which will allow you to monitor the heart rate and rhythm at home (www.alivacor.com). If you have any concerns, please call or have your dog evaluated by a veterinarian. Our emergency clinic is open 24 hours/day.

Recommended Medications:

B6

B6

Diet suggestions: Dogs with ARVC may benefit from the addition of omega-3 fatty acids (fish oil) to the diet. Diets such as the Royal Canin Boxer or Early Cardiac diet, or Hill's j/d have ample fish oil and may not require much (or any) additional supplementation. Additional information on supplements such as fish oil or other supplements that you might have questions about may be found on the Tufts HeartSmart web site: (<http://vet.tufts.edu/heartsmart/diet/>).

- The FDA is currently investigating an apparent association between diet and a type of heart disease called dilated cardiomyopathy. The exact cause is still unclear, but it appears to be associated with boutique diets and those containing exotic ingredient or are grain-free. Therefore, we are currently recommending that dogs do not eat these types of diets.
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If your dog has special nutritional needs or requires a homecooked diet, we recommend you schedule an appointment with our nutritionists (508-887-4696).

Exercise recommendations: For the first 7 to 10 days after starting anti-arrhythmic medications, and until we know that the medications are effectively controlling arrhythmia, we recommend very limited activity. Leash walk only is ideal, and

short walks to start. Once the arrhythmia has been well-controlled then slightly longer walks are acceptable. However, repetitive or strenuous high energy activities (repetitive ball chasing, running fast off-leash, etc.) are not recommended as these activities may result in worsened arrhythmia or even sudden death.

Recheck visits:

A recheck ECG is recommended 1-2 weeks after any antiarrhythmic medication adjustments are made.

Since **B6** was enrolled in the DCM study, we will need to see him back in 3, 6, and 9 months.

Thank you for entrusting us with **B6** care. Please contact our Cardiology liaison at (508)-887-4696 or email us at cardiovet@tufts.edu for scheduling and non-emergent questions or concerns.

Sincerely,

Dr. **B6**

Please visit our HeartSmart website for more information

<http://vet.tufts.edu/heartsmart/>

Prescription Refill Disclaimer:

For the safety and well-being of our patients, your pet must have had an examination by one of our veterinarians within the past year in order to obtain prescription medications.

Ordering Food:

Please check with your primary veterinarian to purchase the recommended diet(s). If you wish to purchase your food from us, please call 7-10 days in advance (508-887-4629) to ensure the food is in stock. Alternatively, veterinary diets can be ordered from online retailers with a prescription/veterinary approval.

Clinical Trials:

Clinical trials are studies in which our veterinary doctors work with you and your pet to investigate a specific disease process or a promising new test or treatment. Please see our website: vet.tufts.edu/cvmc/clinical-studies

Case: **B6**

Owner: **B6**

Discharge Instructions

Cummings
Veterinary Medical Center
AT TUFTS UNIVERSITY

Foster Hospital for Small Animals
55 Willard Street
North Grafton, MA 01536
Telephone (508) 839-5395
Fax (508) 839-7951
<http://vetmed.tufts.edu/>
Referring Vet Direct Line 508-887-4988

Notice of Patient Admit

Date: [B6]:12:55 AM

Case No: [B6]

Referring Doctor: Dr. [B6]

Client Name:
Patient Name: [B6]

Dear Colleague,

Your patient presented to our Emergency service. Please make note of the following information to facilitate communication with our team.

The attending doctor is: Dr. [B6]

The reason for admission to the FHSA is: ARVC, poor systolic function, L-CHF

If you have any questions regarding this particular case, please call 508-887-4988 to reach the ECC Service. Information is updated daily, by noon.

Thank you for your referral to our Emergency Service.

Cummings
Veterinary Medical Center
AT TUFTS UNIVERSITY

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Fax (508) 839-7951
<http://vetmed.tufts.edu/>
Referring Vet Direct Line 508-887-4988

Notice of Patient Admit

Date: [B6] 9:12:55 AM
Referring Doctor: Dr. [B6]
Client Name: [B6]
Patient Name: [B6]

Case No: [B6]

Dear Dr. [B6]

Your patient presented to our Emergency service. Please make note of the following information to facilitate communication with our team.

The attending doctor is: Dr. [B6]
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<http://vetmed.tufts.edu/Charlie>

B6

B6

Male (Neutered)

Canine Boxer Brindle

B6

Daily Update From the Cardiology Service

Today's date: **B6**

Dear Drs at: **B6**

Thank you for referring patients to the Foster Hospital for Small Animals at the Cummings School of Tufts University.

Your patient **B6** was admitted and is being cared for by the Cardiology Service.

Today **B6**

- is in stable condition
- is still in the oxygen cage
- is critically ill
- discharged from the hospital today

Today's treatments include:

- bloodwork planned/pending
- echocardiography -
Severe cardiomegaly with poor contractile function - r/o primary DCM, diet-induced cardiomyopathy, ARVC, tachycardiac induced cardiomyopathy. Left sided congestive heart failure.
- cardiac catheter procedure planned
- ongoing treatment for CHF secondary to DCM
- ongoing treatment for thrombosis
- ongoing treatment for arrhythmia - Malignant ventricular arrhythmia - non-sustained VTach and frequent polymorphic VPCs

Additional plans:

Please allow 3-5 business days for reports to be finalized upon patient discharge.

Please call (508) 887-4696 before 5pm or email us at cardiovet@tufts.edu if you have any questions.

Thank you!

Attending Clinician: [B6] DVM (Resident, Cardiology)
Faculty Clinician: [B6] DVM, DACVIM
Senior student:

Discharge Instructions

Patient

Name: B6

Species: Canine

Black Male (Neutered) Great Dane

Birthdate: B6

Owner

Name:

Address:

B6

Patient ID: B6

Attending Cardiologist:

John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6

Cardiology Technician:

B6

Student: B6

Date: 9/10/2018

Diagnoses:

Dilated cardiomyopathy (DCM) with congestive heart failure - currently well controlled with medications

Atrial fibrillation and ventricular arrhythmias - improved with medications

Case summary:

Thank you for bringing B6 to Tufts to recheck his heart and evaluate how he is doing. We are so glad to see that he has been doing well at home! His echocardiogram shows that his heart is still markedly enlarged, as we expect to see in the progression of DCM. However, we did not see any free fluid currently around the lungs or heart. B6 EKG continues to show atrial fibrillation (as we would expect), but fewer ventricular arrhythmias than the last time, which is good news. However, his heart rate is still higher than ideal so we would like to increase his B6 dose to control this (see below).

We pulled blood today to assess organ function and measure taurine levels. We will call you tomorrow regarding liver and kidney values. We will also call you in about a week with the taurine values. If B6 taurine is low we will want to add a

B6

If you have not heard from us with these results in 2 weeks then please feel free to give us a call.

Monitoring at home:

B6

B6

Recommended Medications:

B6

Diet suggestions:

Dogs with heart failure accumulate more fluid in their body if they eat large amounts of sodium (salt). Sodium can be found in all foods, but some foods are lower in sodium than others. Many pet treats, people foods, and supplements used to give pills often have more sodium than is desirable- a sheet that has suggestions for low sodium treats can be found on the HeartSmart web site (<http://vet.tufts.edu/heartsmart/diet/>)

As per Dr. Lisa Freeman's recommendation, we suggest seeing if B6 likes the Purina Proplan Adult Weight Maintenance. This will help balance B6 dietary and cardiac needs. If he does not like this food we can come up with some more good options for him.

Exercise Recommendations:

When on walks, if you find that B6 is lagging behind or needs to stop on a walk then this was too long a walk and shorter walks are advised in the future. Repetitive or strenuous high energy activities (repetitive ball chasing, running fast off-leash, etc.) are generally not advised.

Recheck Visits:

Please email us an ECG in 10-14 days so we can see how B6 heart rate is on the higher dose of B6

A recheck echocardiogram is recommended in ~4-6 months, or sooner if you have any concerns. Please call or email to schedule this appointment.

Thank you for entrusting us with B6 care. He is such a good boy. Please call 508 839 5395 or email us at cardiovet@tufts.edu for scheduling and non-emergent questions or concerns.

Please visit our HeartSmart website for more information

<http://vet.tufts.edu/heartsmart/>

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For the safety and well-being of our patients, your pet must have had an examination by one of our veterinarians within the past year in order to obtain prescription medications.

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Clinical Trials:

Clinical trials are studies in which our veterinary doctors work with you and your pet to investigate a specific disease process or a promising new test or treatment. Please see our website: vet.tufts.edu/cvmc/clinical-studies

Case:	B6	Owner:	B6	Discharge Instructions
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Radiology Request & Report

Patient

Name: B6
Species: Canine
Black Male (Neutered) Great
Dane
Birthdate: B6

Owner

Name:
Address: B6

Patient ID: B6
Date of request: 2/20/2018

Attending Clinician: B6

Student:

Date of exam: 2/20/18

Patient Location: Ward/Cage:

Weight(lbs) 0.00

- Inpatient
- Outpatient Time:
- Waiting
- Emergency

Sedation

- BAG
- OBAG
- 1/2 dose OBAG
- DexDomitor/Butorphanol
- Anesthesia to sedate/anesthetize

Examination Desired: Met check

Presenting Complaint and Clinical Questions you wish to answer:
Emergency

Pertinent History: Afib diagnosed on 2/17. HR 250 today

Findings:

THORAX, THREE VIEWS:

The cardiac silhouette is moderately to markedly generally enlarged. The pulmonary veins are diffusely mildly distended. There is a patchy interstitial pattern throughout the pulmonary parenchyma, most conspicuous in the perihilar and caudodorsal lungs. Increased opacity is additionally noted in the right cranial lung lobe. Thin pleural fissure lines are present. The mediastinum is normal. There are metallic ECG leads superimposed with the thorax. There is incidental multifocal ventral spondylosis deformans and mild unilateral shoulder degenerative joint disease, laterality unknown. There is an impression of reduced abdominal serosal detail, though this may be overestimated by patient size and technique.

Conclusions:

- Moderate to marked generalized cardiomegaly and pulmonary vascular and parenchymal changes are

most consistent with decompensated congestive heart failure and cardiogenic pulmonary edema. Right cranial lung lobe opacity is thought to represent additional cardiogenic edema. Given scant pleural effusion and impression of reduced serosal detail, a component of biventricular failure may be present. Echocardiography and follow-up radiographs are recommended.

Radiologists

B6

Reviewing:

Dates

Reported: 2/21/2018

Finalized:

By: B6

Subjective

NEW VISIT (ER)

Doctor: B6

Student: B6

Presenting complaint: Tachycardia, Afib

Referral visit? Yes

Diagnostics completed prior to visit: CBC/Chem, ECG (2/17)

HISTORY:

Signalment: 5 yo MN Great Dane

Current history: Coughing and gagging started on Thursday and has been persistent. Brought to vet on Saturday and rec'd coming to Tufts. Sounds like he is trying to clear his throat. Worse when lays down. Has never experienced this before. No collapse or exercise intolerance. Today seemed a little more out of breath.

Coughed up white phelgm once. Diarrhea 3 weeks ago. Eating and drinking normally.

Prior medical history: Dx with Wobblers at 10 months (hasn't gotten any worse)

Current medications: Salmon oil supplements

Diet: Rachael Ray Nutrish Chicken

Vaccination status/flea & tick preventative use: Due for rabies, chewable for heatworm, seresto collar

Travel history: None

EXAM:

B6

C/V: Tachycardic, irregular rhythm with pulse deficits.

B6

ASSESSMENT:

A1: Tachycardia r/o tachyarrhythmia secondary to DCM vs stress vs hypovolemia

A2: Cough, gagging r/o CHF vs pneumonia vs lung pathology

A3: Irregular heart rhythm r/o atrial fibrillation secondary to DCM

A4: Hemoconcentration, hyperlactatemia r/o secondary to dehydration

PLAN:

P1:
P2:
P3:
P4:
P4:
P5:
P6:
P7:
P8:
P9:
P10:
P11:
P12:

B6

Diagnostics completed:

B6

-CXR: Marked generalized cardiomegaly with LAE, interstitial infiltrates consistent with cardiogenic pulmonary edema. Pleural fissure lines.

-Cardio consult: LV walls are thin with markedly reduced contractile function. LV cavity is dilated. LA is moderately dilated. RV and RA are dilated. PA is the same size as the aorta. Trace pleural effusion. No pericardial effusion. No ascites.

-UA: USG [B6]; pH [B6]

Diagnostics pending:

2/20/18

-NT-pro BNP

Client communication:

Discussed with owners that Afib can be due to structural changes in the heart (like DCM) or idiopathic. His prognosis will depend on his underlying cause and his response to treatment. We will take some chest rads and have a cardio consult. We will have him on ECG constantly and start treating his Afib as soon as cardiology sees him. Another doctor will call you tomorrow between 10 am-12 pm.

Deposit & estimate status: [B6]

Resuscitation code (if admitting to ICU): **B6**

SOAP approved (DVM to sign): [B6]

B6

Subjective

EXAM, GENERAL

Subjective (S) **B6** is a 5 yr old MN great dane, who has a history of coughing and gagging which started on Thursday and has been persistent. Brought to vet on Saturday and recc'd coming to Tufts. Has never experienced this before. No collapse or exercise intolerance. Had diarrhea 3 weeks ago. Today is panting with some mild effort, and drinking.

Prior medical history: Dx with **B6** (hasn't gotten any worse)

Current medications: Salmon oil supplements

Objective (O)

B6

H/L: 2/6 left systolic murmur, irregularly irregular heart rhythm, tachycardic, femoral pulses weak but synchronous, lungs normal bronchovesicular sounds, no crackles or wheezes appreciated. Jugular pulse 1/3 up neck.

B6

Assessment (A)

A1: Irregularly irregular heart beat rule out atrial fibrillation vs ventricular tachycardia vs other

A2: Tachycardia rule out atrial fibrillation vs ventricular tachycardia vs other

Plan (P)

P:
P:
P:
P:
P:
P:
P:
P:
B6

SOAP completed by: **B6**

SOAP reviewed by: **B6**

Soap Text Created By - Veterinarian:

B6

Updated on: 9/10/2018 2:15:33 PM By:

B6

Discharge Instructions

Patient

Name: B6

Species: Canine

Black Male (Neutered) Great Dane

Birthdate: B6

Owner

Name: B6

Address: B6

Patient ID: B6

Attending Cardiologist: John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6

Student: B6 V18

Cardiology Technician:

B6

Admit Date: B6 11:16:58 AM

Discharge Date: B6

Diagnoses:

Dilated cardiomyopathy (DCM) with congestive heart failure

Atrial fibrillation and ventricular arrhythmias

Case summary:

Thank you for bringing B6 to tufts for evaluation of his coughing and irregular heart rhythm. B6 has been diagnosed with a primary heart muscle disease called dilated cardiomyopathy (DCM). This disease is more common in large and giant breed dogs and is characterized by thinning of the walls of the heart, reduced cardiac pump function, and enlargement of the upper chambers of the heart. Many dogs with DCM will also have significant arrhythmias which can be life-threatening and also require medical management. The heart enlargement has now progressed to the point of congestive heart failure, meaning that fluid is backing up into the lungs and causing cough. Unfortunately this is a progressive disease and we cannot reverse the changes to the heart muscle, however we can use cardiac medications and some changes to the diet to make B6 comfortable and have him breathing easier.

Diagnostic test results and findings:

Chest radiograph (x-ray) findings: The heart was enlarged and there was fluid in the lungs.

Echocardiogram findings: All chambers of the heart are enlarged and the contractile function is reduced.

ECG findings: The ECG showed atrial fibrillation with rapid ventricular response rate. Additionally there were some ventricular arrhythmias (ventricular premature beats and ventricular tachycardia).

Labwork findings: The kidney values and urinalysis are within normal limits. He has slightly elevated bilirubin, and elevated AST but the rest of his liver values are normal and these values have decreased during his stay.

Monitoring at home:

B6

Recommended Medications:

B6

Diet suggestions:

Dogs with heart failure accumulate more fluid in their body if they eat large amounts of sodium (salt). Sodium can be found in all foods, but some foods are lower in sodium than others. Many pet treats, people foods, and supplements used to give pills often have more sodium than is desirable - a sheet that has suggestions for low sodium treats can be found on the HeartSmart web site (<http://vet.tufts.edu/heartsmart/diet/>)

Your dog's usual diet may also have more sodium than recommended - we want him to continue to eat his normal diet for the first 7 to 14 days so we can make sure he is tolerating medications well, but after that time we would recommend slowly introducing one of the lower sodium diets on the HeartSmart list (25% of the new diet and 75% old diet for 2-3 days, then 50:50, etc.). Hopefully you can find a diet on the list that your dog likes to eat. Alternatively, you can research the amount of sodium in the diet to ensure that the sodium content is similar to those on the list.

Exercise Recommendations:

For the first 7 to 10 days after starting medications for heart failure we recommend very limited activity. Leash walking only is ideal, and short walks to start. Once the heart failure is better controlled, then slightly longer walks are acceptable. However, if you find that [B6] is lagging behind or needs to stop on a walk then this was too long a walk and shorter walks are advised in the future. Repetitive or strenuous high energy activities (repetitive ball chasing, running fast off-leash, etc.) are generally not advised.

Recheck Visits:

A recheck visit is recommended in 1-2 weeks to check kidney values, electrolytes, and liver values. An ECG is also recommended at that time. This can be done with us or with your primary care veterinarian. If you have any concerns are how things are going then we would prefer for [B6] to come here for that recheck.

A recheck echocardiogram is recommended in 3-4 months, or sooner if you have any concerns. Please call or email to schedule this appointment.

Thank you for entrusting us with [B6] care. He is such a sweet boy. Please contact our Cardiology liaison, [B6] at [B6] or email us at cardiovet@tufts.edu for scheduling and non-emergent questions or concerns.

Please visit our HeartSmart website for more information
<http://vet.tufts.edu/heartsmart/>

Prescription Refill Disclaimer:

For the safety and well-being of our patients, your pet must have had an examination by one of our veterinarians within the past year in order to obtain prescription medications.

Ordering Food:

Please check with your primary veterinarian to purchase the recommended diet(s). If you wish to purchase your food from us, please call 7-10 days in advance (508-887-4629) to ensure the food is in stock. Alternatively, veterinary diets can be ordered from online retailers with a prescription/veterinary approval.

Clinical Trials:

Clinical trials are studies in which our veterinary doctors work with you and your pet to investigate a specific disease process or a promising new test or treatment. Please see our website: vet.tufts.edu/cvmc/clinical-studies

Case: [B6]

Owner: [B6]

Discharge Instructions

Discharge Instructions

Patient

Name: B6

Species: Canine

Black Male (Neutered) Great Dane

Birthdate: B6

Owner

Name: B6

Address: B6

Patient ID: B6

Attending Cardiologist:

John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6

Student:

B6

Cardiology Technician:

B6

Admit Date: B6 11:16:58 AM

Discharge Date: B6

Diagnoses:

Dilated cardiomyopathy (DCM) with congestive heart failure

Atrial fibrillation and ventricular arrhythmias

Case summary:

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Monitoring at home:

B6

Recommended Medications:

B6

Diet suggestions:

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A recheck visit is recommended in 1-2 weeks to check kidney values, electrolytes, and liver values. An ECG is also recommended at that time. This can be done with us or with your primary care veterinarian. If you have any concerns are how things are going then we would prefer for [B6] to come here for that recheck.

A recheck echocardiogram is recommended in 3-4 months, or sooner if you have any concerns. Please call or email to schedule this appointment.

Thank you for entrusting us with [B6] care. He is such a sweet boy. Please contact our Cardiology liaison, [B6] at [B6] or email us at cardiovet@tufts.edu for scheduling and non-emergent questions or concerns.

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Clinical trials are studies in which our veterinary doctors work with you and your pet to investigate a specific disease process or a promising new test or treatment. Please see our website: vet.tufts.edu/cvmc/clinical-studies

Case: [B6]

Owner: [B6]

Discharge Instructions

Discharge Instructions

Patient

Name: B6

Species: Canine

Black Male (Neutered) Great Dane

Birthdate: B6

Owner

Name:
Address:
B6

Patient ID: B6

Attending Cardiologist:

John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6 B6

Cardiology Technician:

B6

Student: B6

Date: 9/10/2018

Diagnoses:

Dilated cardiomyopathy (DCM) with congestive heart failure - currently well controlled with medications

Atrial fibrillation and ventricular arrhythmias - improved with medications

Case summary:

Thank you for bringing B6 to Tufts to recheck his heart and evaluate how he is doing. We are so glad to see that he has been doing well at home! His echocardiogram shows that his heart is still markedly enlarged, as we expect to see in the progression of DCM. However, we did not see any free fluid currently around the lungs or heart. B6 EKG continues to show atrial fibrillation (as we would expect), but fewer ventricular arrhythmias than the last time, which is good news. However, his heart rate is still higher than ideal so we would like to increase his B6 dose to control this (see below).

We pulled blood today to assess organ function and measure taurine levels. We will call you tomorrow regarding liver and kidney values. We will also call you in about a week with the taurine values. If B6 taurine is low we will want to add a

B6. If you have not heard from us with these results in 2 weeks then please feel free to give us a call.

Monitoring at home:

B6

B6

Recommended Medications:

B6

Diet suggestions:

Dogs with heart failure accumulate more fluid in their body if they eat large amounts of sodium (salt). Sodium can be found in all foods, but some foods are lower in sodium than others. Many pet treats, people foods, and supplements used to give pills often have more sodium than is desirable- a sheet that has suggestions for low sodium treats can be found on the HeartSmart web site (<http://vet.tufts.edu/heartsmart/diet/>)

As per Dr. Lisa Freeman's recommendation, we suggest seeing if **B6** likes the Purina Proplan Adult Weight Maintenance. This will help balance **B6** dietary and cardiac needs. If he does not like this food we can come up with some more good options for him.

Exercise Recommendations:

When on walks, if you find that **B6** is lagging behind or needs to stop on a walk then this was too long a walk and shorter walks are advised in the future. Repetitive or strenuous high energy activities (repetitive ball chasing, running fast off-leash, etc.) are generally not advised.

Recheck Visits:

Please email us an ECG in 10-14 days so we can see how **B6** heart rate is on the higher dose of **B6**

A recheck echocardiogram is recommended in ~4-6 months, or sooner if you have any concerns. Please call or email to schedule this appointment.

Thank you for entrusting us with **B6** care. He is such a good boy. Please call 508 839 5395 or email us at cardiovet@tufts.edu for scheduling and non-emergent questions or concerns.

Please visit our HeartSmart website for more information

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Case: B6

Owner: B6

Discharge Instructions

Foster Hospital for Small Animals
55 Willard Street
North Grafton, MA 01536
Telephone (508) 839-5395
Fax (508) 839-7951
<http://vetmed.tufts.edu/>

Radiology Request & Report

Patient

Name: B6
Species: Canine
Black Male (Neutered) Great
Dane
Birthdate: B6

Owner

Name:
Address:
B6

Patient ID: B6
Date of request: 2/20/2018

Attending Clinician: B6

Student:

Date of exam: 2/20/18

Patient Location: Ward/Cage:

Weight(lbs) 0.00

- Inpatient
 Outpatient Time:
 Waiting
 Emergency

Sedation

- BAG
 OBAG
 1/2 dose OBAG
 DexDomitor/Butorphanol
 Anesthesia to sedate/anesthetize

Examination Desired: Met check

Presenting Complaint and Clinical Questions you wish to answer:
Emergency

Pertinent History: Afib diagnosed on 2/17. HR 250 today

Findings:

THORAX, THREE VIEWS:

The cardiac silhouette is moderately to markedly generally enlarged. The pulmonary veins are diffusely mildly distended. There is a patchy interstitial pattern throughout the pulmonary parenchyma, most conspicuous in the perihilar and caudodorsal lungs. Increased opacity is additionally noted in the right cranial lung lobe. Thin pleural fissure lines are present. The mediastinum is normal. There are metallic ECG leads superimposed with the thorax. There is incidental multifocal ventral spondylosis deformans and mild unilateral shoulder degenerative joint disease, laterality unknown. There is an impression of reduced abdominal serosal detail, though this may be overestimated by patient size and technique.

Conclusions:

- Moderate to marked generalized cardiomegaly and pulmonary vascular and parenchymal changes are

most consistent with decompensated congestive heart failure and cardiogenic pulmonary edema. Right cranial lung lobe opacity is thought to represent additional cardiogenic edema. Given scant pleural effusion and impression of reduced serosal detail, a component of biventricular failure may be present. Echocardiography and follow-up radiographs are recommended.

Radiologists

Primary:

Reviewing:

Dates

Reported: 2/21/2018

Finalized:

Cummings Veterinary Medical Center

AT TUFTS UNIVERSITY
Cardiology Liaison: 508-887-4696

B6

Patient ID: **B6**

B6

Canine

15 Old Male (Neutered) Great

Dane

Black BW: Weight(lbs) 0.00

Cardiology Inpatient

Date: 2/20/2018

Weight: Weight(lbs) 0.00

Attending Cardiologist:

John E. Rush DVM, MS, DACVIM (Cardiology), DACVECC

B6

Cardiology Resident:

B6

Thoracic radiographs available for review?

- Yes - in SS
- Yes - in PACS
- No

Presenting complaint and important concurrent diseases:

History of gagging/coughing. Tachycardia and irregular heart rhythm appreciated at referring veterinarian. No history of exercise intolerance or syncope.

Current medications and doses: Salmon oil

Key indication for consultation: Irregular heart rhythm, pulse deficits, tachycardia

Questions to be answered from the Consult:

Evidence of DCM vs other? Evidence of CHF?

Is your consult time-sensitive? (e.g., anesthesia today, owner waiting, trying to get biopsy today)

- Yes (explain)
- No

STOP - remainder of form to be filled out by Cardiology

Physical Examination

B6

Muscle condition:

- Normal
- Mild muscle loss
- Moderate cachexia
- Marked cachexia

Cardiovascular Physical Exam

Murmur Grade:

- None
- I/VI
- II/VI
- III/VI
- IV/VI
- V/VI
- VI/VI

Murmur location/description: systolic left apical

Jugular vein:

- Bottom 1/3 of neck
- Middle 1/3 of neck
- Top 2/3 of neck

Arterial pulses:

- Weak
- Fair
- Good
- Strong
- Bounding
- Pulse deficits
- Pulsus paradoxus
- Other (describe):

Arrhythmia:

- None
- Sinus arrhythmia
- Premature beats
- Bradycardia
- Tachycardia, irregular

Gallop:

- Yes
- No
- Intermittent
- Pronounced
- Other:

Pulmonary assessments:

- Eupneic
- Mild dyspnea
- Marked dyspnea
- Normal BV sounds
- Pulmonary Crackles
- Wheezes
- Upper airway stridor
- Other auscultatory findings:

Abdominal exam:

- Normal
- Hepatomegaly
- Abdominal distension
- Mild ascites

Echocardiogram Findings:

B6

B6

Assessment and recommendations:

Echocardiogram reveals severe DCM with moderate secondary LAE, and EKG reveals atrial fibrillation with rapid ventricular response rate. Changes are consistent with CHF being the cause for reported cough. Recommend treating with and consider addition of an when eating and not azotemic. Recommend treating atrial fibrillation with and low dose of . Recommend hospitalization for monitoring with of . Recommend submitting baseline blood work if not done recently, and ideally an NTproBNP. Recheck renal values level 6-8 hours post pill, and ECG in 7-10 days. Recheck echo/fluid check in ~3 months, or sooner if clinical sign occur such as increased cough, collapse, or exercise intolerance.

Addendum: Overnight telemetry showed relatively frequent VPCs, couplets with R on T morphology, and occasional non sustained ventricular tachycardia. Recommend stopping and adding at 400 mg PO BID for 7 days, then SID.

Treatment plan:

B6

Final Diagnosis:

DCM, CHF
Atrial fibrillation with rapid ventricular response rate

Heart Failure Classification Score:

ISACHC Classification:

- | | |
|-----------------------------|--|
| <input type="checkbox"/> Ia | <input type="checkbox"/> IIIa |
| <input type="checkbox"/> Ib | <input checked="" type="checkbox"/> IIIb |
| <input type="checkbox"/> II | |

Sample Submission Form

B6

UC CUSTOMERS ONLY:
Non-federal funds ID/Account Number
to bill: _____

B6

Vet/Tech Contact: B6
 Company Name: Tufts Cummings School of Vet Med - Clinical Pathology Laboratory
 Address: 200 Westboro Road
 North Grafton, MA 01536
 Email: clinpath@tufts.edu;
 Tel: 508-887-4669 Fax: 508-839-7936

Billing Contact: B6 TAX ID: _____
 Email: B6 Tel: 508-B6

Patient Name: B6
 Species: canine
 Owner's Name: B6

Sample Type: Plasma Whole Blood Urine Food Other: _____
 Test Items: Taurine Complete Amino Acid Other: _____

Taurine Results (nmol/ml)
 Plasma: B6 Whole Blood: B6 Urine: _____ Food: _____

Reference Ranges (nmol/ml)

	Plasma		Whole Blood	
	Normal Range	No Known Risk for Taurine Deficiency	Normal Range	No Known Risk for Taurine Deficiency
Cat	80-120	>40	300-600	>200
Dog	60-120	>40	200-350	>150

B6

TAURINE PANEL
Lithium Heparin

NC State University
Veterinary Hospital
1052 William Moore Drive
Raleigh, NC 27607
Discharge Comments

Fax: Admin
Fax: Referral

Small Animal (919) 513-6500
Large Animal (919) 513-6630

Client B6	Patient B6 DOBERMAN PINSCHER MC BLACK&TAN CANINE	Case # 225069 41.3kg	Attending DVM Student Discharging DVM Referring DVM	B6 B6
----------------------------	---	-----------------------------	--	----------------------------

Admission Date/Time: APR 20, 2018 09:52 AM Discharge Date/Time: APR 20, 2018 02:55 PM Discharge Status:

CASE SUMMARY

DIAGNOSIS:

1. Dilated cardiomyopathy (DCM)
2. Congestive heart failure- improving
3. **B6**

HISTORY:

B6 is an approximately 4 year old male castrated Doberman Pinscher who presented to the NCSU Cardiology Service on 4/20/18 for evaluation of suspect dilated cardiomyopathy.

B6 initially presented to **B6** on **B6** for dyspnea. **B6** had been coughing for 5 days up to presentation and at that time thoracic radiographs revealed markedly enlarged cardiac silhouette with marked left atrial enlargement and a severe diffuse interstitial to alveolar pattern with pulmonary vascular distention. ECG showed a regular sinus rhythm. **B6** was treated for congestive heart failure with an initial high dose injection of **B6**. **B6** presented to his primary care veterinarian one week later for a recheck. He had improved significantly since his **B6** visit and had not had any episodes of coughing. His **B6** was continued at the previous dose. He was then referred to NCSU for further evaluation.

B6 was doing well prior to his visit to the ER. He has not had any episodes of increased respiratory rate, exercise intolerance or effort or collapse. He has continued to eat and drink well with no vomiting or diarrhea. His diet consists of Acana Grain Free- Chicken, Turkey and Nest-laid Eggs with occasional yogurt and chicken chips. This has been his diet since he was adopted 2 years ago from a rescue. Although maintaining a good appetite **B6** has noticed that **B6** has lost about 10 pounds in the past month. **B6** diet was increased to compensate for his weight loss. For flea/tick and HW medication he receives Nexgard and Heartgard. His current medications include **B6**.

B6

CV/R: III/VI left apical systolic murmur, gallop sound ausculted, intermittent premature beats ausculted, femoral pulses moderate with **B6**

B6

RESULTS OF DIAGNOSTIC TESTS:

1. CHEST RADIOGRAPHS- Moderate left sided cardiomegaly. Marked pulmonary venous congestion and mild perihilar and caudodorsal unstructured interstitial pattern. Consistent with Left sided congestive heart failure.
2. ECHOCARDIOGRAM - severely dilated left ventricular cavity with reduced systolic function consistent with dilated cardiomyopathy.

B6

B6

ASSESSMENT:

Thank you for bringing **B6** in to see us today! He is such a sweet boy! Today, we evaluated **B6** for congestive heart failure and underlying heart disease.

First, on his physical examination we found a grade III/VI left apical heart murmur. Next, we performed chest radiographs which revealed left sided cardiomegaly. Although the chest radiographs are much improved from his visit to the ER, there is still evidence of fluid in his lungs or congestive heart failure. An echocardiogram (ultrasound of the heart) was performed next which was consistent with our diagnosis of DCM.

As discussed, **B6** has been diagnosed with a heart condition known as dilated cardiomyopathy (DCM). DCM is a disease of unknown cause affecting the muscle of the heart and is most commonly seen in large breed dogs (such as Dobermans, Great Danes, and Labrador Retrievers). Although the exact mechanism of DCM is currently unknown, dietary taurine/carnitine deficiencies and potentially dogs on grain-based diets, genetics and toxins have all been linked to DCM. Although our suspicion for the cause of **B6** DCM is genetic and less linked to nutrition, we have submitted a test to evaluate taurine levels in **B6** blood.

The overall effect of DCM is a decrease in the contractility (pumping ability) of the heart. Because the heart is unable to pump with enough vigor to move blood adequately forward into circulation, a volume overload occurs and the heart dilates to accommodate it. As a result, the chambers of the heart become very large, and the walls of the heart become very thin. Ultimately, the heart is unable to accommodate and dilate further, the result is back-up of blood from the heart and into the lungs, known as congestive heart failure ("fluid on the lungs"). It is important to know that this disease is progressive, and ultimately those patients affected with it will experience congestive heart failure (like **B6** current situation).

Changes in the muscle of the heart in dogs with DCM can lead to fibrosis and remodeling of the myocardium (heart muscle), which can lead to secondary arrhythmias (abnormal heart rhythm) caused by abnormal impulse conduction. Normally, electrical signals are sent through conductive pathways that signal the heart to contract in a synchronous manner. The diseased heart muscle can also initiate abnormal electrical impulses that do not utilize the normal conduction pathways of the heart. As we discussed, arrhythmias occur commonly in dogs with DCM, with some dogs experiencing sudden death as a result.

B6 ECG today showed intermittent evidence of an arrhythmia called ventricular premature complex. We would like to Holter **B6** over 24 hours to get a better understanding of the severity of these arrhythmias. However, as discussed it may be best to perform this when his congestive failure has resolved and this will be the focus in the short term.

Unfortunately, we cannot cure DCM. We can however, try to decrease and slow down the secondary effects on the heart from DCM and control the fluid in **B6** lungs. Based on our radiographs today, we are increasing **B6** as well as starting a third medication. Please see below for instructions. Please continue to monitor **B6** for signs of worsening of heart failure such as increased exercise intolerance, labored breathing, increased coughing or fainting. Call NCSU Cardiology or your referring veterinarian if any of these signs occur.

We would like you to continue monitoring **B6** respiratory rate at rest. This can be done by counting the number of breaths **B6** takes in 15 seconds and multiplying by 4 (to get the total breaths per minute). This number should remain less than 30-40 at rest. If it is higher while he is sleeping or resting, please contact a veterinarian.

INSTRUCTIONS FOR CARE

MEDICATIONS:

B6

ACTIVITY:

Please avoid strenuous exercise or situations which place undue stress on [B6] In general, pets with heart disease will self-regulate their exercise. Please monitor for any change in exercise capability.

DIET:

We recommend that [B6] be fed a diet that is not grain-free. Although we do not yet have the data to prove that grain-free diets lead to DCM, we are highly suspicious there is a correlation. Additionally, we also recommend he is fed a diet that is mildly to moderately restricted in salt. A commercial "Senior" diet is formulated with an appropriate salt content. Please avoid salty treats, such as hot dogs or jerky treats

RECOMMENDATIONS FOR FURTHER EVALUATION:

B6

If you have any concerns with how [B6] is doing, or to schedule an appointment, please contact the NC State Veterinary Hospital at 919-513-6694. There is a veterinarian on call 24 hours a day.

NOTE: If [B6] is in need of emergency aid and you are not able to get to the NC State Veterinary Hospital quickly, please seek care at the nearest veterinary emergency facility. Take these discharge instructions and current medications with you so that the treating veterinarian will know as much as possible regarding your pets' medical condition.

Owner- [B6]

[B6]

Student- [B6]

Clinicians:
Dr. Darcy Adin

Residents:
B6

Clinical Technicians:
B6

Client Services:
[B6]

B6

Research Technician
[B6]

In order to help expedite medication refills, please visit us online at www.ncstatevets.org and select Pet Owners, Pharmacy Refills.

NC State University
Veterinary Hospital
1052 William Moore Drive
Raleigh, NC 27607
Discharge Comments

Fax: Admin
Fax: Referral

Small Animal (919) 513-6500
Large Animal (919) 513-6630

Client B6	Patient B6 DOBERMAN PINSCHER MC BLACK&TAN CANINE	Case # B6 41.3 kg	Attending DVM Student Discharging DVM Referring DVM	B6
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Admission Date/Time: MAY 10, 2018 11:01 AM Discharge Date/Time: MAY 10, 2018 01:32 PM Discharge Status:

CASE SUMMARY

DIAGNOSIS

1. Dilated cardiomyopathy
2. Congestive heart failure (3/17/18) - resolved
3. Ventricular ectopy

HISTORY:

B6 is an approximately 4 year old male castrated Doberman Pinscher who was presented to the NCSU Cardiology Service for a recheck of dilated cardiomyopathy, congestive heart failure, and ventricular premature complexes.

B6 was first seen by the **B6** on **B6** for dyspnea. He had been coughing for five days up to that presentation and at that time thoracic radiographs revealed markedly enlarged cardiac silhouette with severe pulmonary edema. An ECG showed a regular sinus rhythm. **B6** was treated for congestive heart failure with an initial high dose injection **B6** presented to his primary care veterinarian one week later for a recheck. He had improved significantly since his ER visit and had not had any episodes of coughing. His **B6** was continued at the previous dose. He was then referred to NCSU for further evaluation.

B6 then presented to the Small Animal Cardiology Service on 4/20/2018 for evaluation of suspected dilated cardiomyopathy. Thoracic radiographs showed moderate left sided cardiomegaly with marked pulmonary venous congestion and mild perihilar and caudal unstructured interstitial pattern consistent with persistent left sided congestive heart failure. An echocardiogram showed severely dilated left ventricular cavity with reduced systolic function consistent with dilated cardiomyopathy. An EKG showed sinus rhythm with periods of ventricular bigeminy. A whole blood taurine was submitted and returned within normal limits **B6**. **B6** Therapy with **B6** was also started, and supplements for DCM were discussed. It was also recommended to transition **B6** to a diet that contains grains - due to the recent association seen with DCM and grain free diets.

Since **B6** last visit to NCSU Cardiology Service, he has been doing very well at home. He has excellent energy, is eating and drinking normally, and has not been coughing. **B6** resting respiratory rates at home have been between 19 and 24 breaths per minute. **B6** medications have continued from the last visit. **B6** at the same doses as listed above. He has been eating Orijen Regional Red Grain Free diet plus added whole oats and Wild Alaskan Salmon fish oil. **B6** was seen by his primary care veterinarian on 5/2/18 and had bloodwork performed which returned with unremarkable results **B6**.

B6

CV/RESP: III-IV/VI left apical systolic murmur, intermittent premature beats ausculted, femoral pulses moderate, no crackles or wheezes on auscultation of lung fields

B6
B6
B6

B6

DIAGNOSTICS:

- 1. Blood Pressure: 150 mmHg (Doppler, #5 cuff, right front leg, lateral recumbency) - anxious
- 2. Thoracic radiographs
 - a. Similar left-sided cardiomegaly with left atrial enlargement and pulmonary venous congestion - consistent with history of dilated cardiomyopathy.
 - b. Mildly improved unstructured interstitial pattern - differentials include residual cardiogenic pulmonary edema or age related change and fibrosis.

B6

3. Holter monitor: results pending

ASSESSMENT

Thank you for bringing B6 in to see us today. We are pleased to hear he is doing so well at home!

Today we performed chest radiographs to assess his response to the increased medications. We are happy to report his chest radiographs have shown improvement over the past month. The previously noted fluid has resolved. B6 continues to have a very mild pattern present in his lungs - however considering he is doing so well at home, this is likely a normal finding for him. We would like to continue his cardiac medications at their current dosages. We would also like to begin a medication called B6 balances. Please see below for dosing instructions. B6 his medication will help to prevent cardiac remodeling, and maintain electrolyte B6 should have his kidney values rechecked 2 weeks after beginning this medication.

Today we also placed a holter monitor to evaluate B6 heart rhythm over a 24 hour period. Please follow the instructions provided and return the monitor tomorrow. We will contact you with the results.

Please continue to monitor B6 for signs of worsening of heart failure such as increased exercise intolerance, labored breathing, coughing or fainting. Call NCSU Cardiology or your referring veterinarian if any of these signs occur.

INSTRUCTIONS FOR CARE

MEDICATIONS:

B6

ACTIVITY: Please avoid strenuous activity or situations which place undue stress on B6. In general, pets with heart disease will self-regulate their exercise. Please monitor for any change in exercise capability.

DIET: As we discussed, we would recommend transitioning your dogs to a diet that contains grains. We have seen an association between grain free diets and poor cardiac function recently. Although there is currently no scientific evidence, we have seen an increasing number of dogs with this problem. Some brands to consider include the major commercial brands (Purina, Hills, Royal Canin, Iams). These companies have excellent quality assurance testing and veterinarians on staff. As previously discussed - a senior diet will be formulated with the appropriate amount of salt for B6. Please avoid treats that are high in salt.

MONITORING:

1. Please continue to monitor B6 for signs of recurrent congestive heart failure. These would include exercise intolerance, increased respiratory rate, difficulty breathing, episodes of fainting/collapse, or decreased appetite. If you notice any of these signs, please contact us and have him evaluated by a veterinarian.

treating veterinarian will know as much as possible regarding your pet's medical condition.

Owner

Clinician

Student

Referring Veterinarians - please visit us online at www.ncstatevets.org/veterinarians and fill out our RDVM Feedback Survey!

Clinicians:

Dr. Darcy Adin

B6

Residents:

B6

Clinical Technicians:

B6

Client Services:

B6

Research Technician

B6

In order to help expedite medication refills, please visit us online at www.ncstatevets.org and select Pet Owners, Pharmacy Refills.

NC State University
Veterinary Hospital
1052 William Moore Drive
Raleigh, NC 27607
Discharge Comments

Fax: Admin
Fax: Referral

Small Animal (919) 513-6500
Large Animal (919) 513-6630

Client B6	Patient B6 DOBERMAN PINSCHER MC BLACK&TAN CANINE	Case # B6 41.3 kg	Attending DVM Student Discharging DVM Referring DVM	B6
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Admission Date/Time: JUN 05, 2018 09:27 AM Discharge Date/Time: JUN 06, 2018 12:00 AM Discharge Status:

NORTH CAROLINA STATE UNIVERSITY OPHTHALMOLOGY SERVICE
DISCHARGE INFORMATION AND TREATMENT PLAN

OPHTHALMIC HISTORY

B6 an approximately 6 year old male castrated Doberman Pinscher, presented to the North Carolina State University **B6** has had the mass since the **B6** adopted him in **B6**. Recently, th **B6**

B6 is also a patient of the Cardiology Service and is treated for dilated cardiomyopathy and congestive heart failure. Please see previous discharges for more information.

B6

OPHTHALMIC EXAMINATION DESCRIPTION:

B6

B6

DIAGNOSIS:

- B6**
- 2) Dilated cardiomyopathy
- 3) Congestive heart failure (3/17/18) - resolved
- 4) Ventricular ectopy

PROCEDURES PERFORMED:

B6

ASSESSMENT:

B6

TOPICAL OCULAR TREATMENT:

B6

MEDICAL THERAPY:

B6

ORAL MEDICATIONS

B6

PLANS FOR RE-EVALUATION: B6 does not need a recheck, however, please follow up with your veterinarian or NCSU with any concerns. If you notice any eye issues then schedule an appointment with the NCSU Ophthalmology service.

B6 / Clinician B6 / Student B6

Ophthalmology Service Email: B6

Ophthalmology Service Phone Number: B6

Referring Veterinarians - please visit us online at www.ncstatevets.org/veterinarians and fill out our RDVM Feedback Survey!

In order to help expedite medication refills, please visit us online at www.ncstatevets.org and select Pet Owners, Pharmacy Refills.

NOTE: If your animal is in need of emergency aid please seek care at the nearest veterinary emergency facility or service. Take these discharge instructions with you so that the treating veterinarian will know as much as possible regarding your animal's medical condition. Please ask the veterinarian to call the ophthalmology service for more information if needed. NCSU Small Animal Emergency Phone Number: 919-513-6911

Emergency care may be required if you observe your animal: 1) holding his/her eye closed, 2) develop sudden redness or cloudiness, 3) having excessive drainage from the eye, or 4) develop other signs of illness, such as vomiting, diarrhea, lethargy, or loss of appetite. Please call your local veterinarian or us if you observe these changes.

Please bear in mind when scheduling appointments that if we have not seen your pet in over 14 months, a full exam will be due in accordance with hospital policy.

NC STATE VETERINARY HOSPITAL OPHTHALMOLOGY SERVICE PERSONNEL

Senior Clinicians: B6

Residents: B6

Clinical Technicians: B6

Client Service Representative: B6

NC State University
Veterinary Hospital
1052 William Moore Drive
Raleigh, NC 27607
Discharge Comments

Fax: Admin
Fax: Referral

Small Animal (919) 513-6500
Large Animal (919) 513-6630

Client B6	Patient B6 DOBERMAN PINSCHER MC BLACK&TAN CANINE	Case # B6 41.3 kg	Attending DVM Student Discharging DVM Referring DVM	B6
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Admission Date/Time: **B6** 07:40 PM Discharge Date/Time: **B6** 01:16 PM Discharge Status: NORMAL

CASE SUMMARY

Diagnoses/Problems:

- B6**
- B6**
- 3. Historical dilated cardiomyopathy with ventricular ectopy
- 4. Historical congestive heart failure
- B6**

History:

B6 a 4 year old male castrated Doberman Pinscher, presented to the NC State Small Animal Emergency Service on **B6** for evaluation of ambulatory paraparesis. On the morning of presentation **B6** was very active and willing to play with the owner outside, even running around. However, at approximately 3 PM, **B6** found **B6** vocalizing on the owner's bed and seeming unable to get down on his own, which is unusual, as he usually jumps up and down without difficulty. **B6** noticed later that **B6** was slow to rise and seemed to have some difficulty supporting weight as he walked. He took **B6** outside, where he sank down on his knees while urinating. This prompted presentation to NC State for further evaluation.

B6 has been a patient of the Cardiology Service since 4/20/18 for the management of dilated cardiomyopathy with ventricular ectopy with congestive heart failure. He receives:

B6

B6

B6

CV/RESP: Regular rhythm, grade III-IV/VI left systolic murmur, femoral pulses moderate; appropriate pulses and temperature in all four limbs; lung fields clear with normal lung sounds.

B6

Assessment:

Thank you for entrusting us with **B6** care. He is a very sweet boy, and it is clear that you are very dedicated to him. As we discussed, the diagnosis for the underlying cause of **B6** weakness remains open, with both neurological and orthopedic causes possible. The differential diagnosis includes:

B6

B6

INSTRUCTIONS FOR CARE OF YOUR PET

Medications:

B6

Activity / Cautions:

B6

Monitoring:

B6

2. Please continue to measure **B6** respiration rate at night. This is the best indicator that can be done at home to assess his heart function. If at any point his respiration rate is greater than 30 breaths/min, please consult a veterinarian.

FOLLOW-UP: If **B6** is not improved by end of this weekend, please bring him in to your primary veterinarian early next week. They can assess his progress and may make any necessary changes to **B6** treatment plan. If he is getting worse, please bring **B6** in to NCSU Small Animal Emergency Service right away.

B6 can be seen through the NCSU Emergency Room within 24 hours with no additional exam fee (any diagnostics or therapeutics would accrue charges). If you are concerned about him at any time, please have him re-evaluated by a veterinarian on an emergent basis. Please call us at 919-513-6911 at any time if you have any questions or concerns. This line is operational 24 hours a day. Thank you!

In order to help expedite medication refills, please visit us online at www.ncstatevets.org and select Pet Owners, Pharmacy Refills.

Owner: **B6**

Clinician: **B6**

Student: **B6**

SMALL ANIMAL EMERGENCY SERVICE TEAM:

Faculty:

B6

Residents/Fellows:

B6

Interns:

B6

Supervisor:

B6

Technicians:

B6

Client Services:

B6

Referring Veterinarians - please visit us online at www.ncstatevets.org/veterinarians and fill out our RDVM Feedback Survey!

THESE INSTRUCTIONS WERE PROVIDED TO THE CLIENT

CLINICIAN:

B6

Date:

B6

CASE SUMMARY:

Thank you for entrusting us with the care of your companion. The Discharge Summary will be emailed to you and faxed to your RDVM within 24 hours of release/discharge from our facility at: B6 If you or your veterinarian do not receive this, please contact the SA Emergency Service to request a copy. The following will briefly outline the care your companion should receive at home and was explained by our staff at the time of discharge:

DIAGNOSIS (ES):

B6

INSTRUCTIONS FOR CARE OF YOUR PET:

Medications:

B6

Activity / Cautions:

B6

Monitoring:

B6

B6 can be seen through the NCSU Emergency Room within 24 hours with no additional exam fee (any diagnostics or therapeutics would accrue charges). If you are concerned about him at any time, please have him re-evaluated by a veterinarian on an emergent

basis. Please call us at 919-513-6911 at any time if you have any questions or concerns. This line is operational 24 hours a day. Thank you!

IF YOU HAVE ANY QUESTIONS OR PROBLEMS, PLEASE CALL THE SMALL ANIMAL EMERGENCY SERVICE AT (919) 513-6911.

PLEASE CALL TO MAKE YOUR FOLLOW UP APPOINTMENT AS RECOMMENDED

_____/_____/_____
Owner's Signature Clinician's Signature Student's Signature

NC State University
Veterinary Hospital
1052 William Moore Drive
Raleigh, NC 27607
Discharge Comments

Fax: Admin
Fax: Referral

Small Animal (919) 513-6500
Large Animal (919) 513-6630

Client B6	Patient B6 DOBERMAN PINSCHER MC BLACK&TAN CANINE	Case B6 41.3kg	Attending DVM Student Discharging DVM Referring DVM	B6
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Admission Date/Time: AUG 14, 2018 09:27 AM Discharge Date/Time: AUG 14, 2018 12:57 PM Discharge Status:

CASE SUMMARY

DIAGNOSIS

1. Dilated cardiomyopathy - suspect at least partially diet induced
2. Congestive heart failure (3/17/18) - well controlled
3. Ventricular ectopy

B6

HISTORY:

B6 is an approximately 4 year old male castrated Doberman Pinscher who presented to the NCSU Cardiology Service on 8/14/18 for a recheck of his dilated cardiomyopathy (DCM), congestive heart failure (CHF), and ventricular premature complexes.

B6 was first seen by the B6 on B6 for dyspnea. He had been coughing for five days up to that presentation and at that time thoracic radiographs revealed markedly enlarged cardiac silhouette with severe pulmonary edema. An ECG showed a regular sinus rhythm. B6 was treated for congestive heart failure with an initial high dose injection of B6 presented to his primary care veterinarian one week later for a recheck. He had improved significantly since his B6 visit and had not had any episodes of coughing. His B6 was continued at the previous dose. He was then referred to NCSU for further evaluation.

Thor presented to the NCSU Cardiology Service on 4/20/18 for evaluation of suspected dilated cardiomyopathy. Thoracic radiographs showed moderate left sided cardiomegaly with marked pulmonary venous congestion and mild perihilar and caudal unstructured interstitial pattern consistent with persistent left sided congestive heart failure. An echocardiogram showed severely dilated left ventricular cavity with reduced systolic function consistent with dilated cardiomyopathy. An ECG showed sinus rhythm with periods of ventricular bigeminy. A whole blood taurine was submitted and returned within normal limits. B6 Therapy with B6 was also started, and supplements for DCM were discussed. It was also recommended to transition B6 to a diet that contains grains - due to the recent association seen with DCM and grain free diets. A recheck evaluation in May 2018 showed resolution of the previously noted pulmonary edema. A holter monitor showed a low number of ventricular arrhythmias, but not severe enough to warrant antiarrhythmic therapy. Spironolactone was added to his medication regime.

Since B6 last visit to NCSU Cardiology Service, he has been doing very well at home. He has had far more energy, and has shown no exercise intolerance or collapse. He is also far more playful and will actually jump around with his sister now. He is eating and drinking normally, and has not had any issues with coughing or increased respiratory rate or effort. B6 resting respiratory rates at home have been between 16 and 20 brpm. Approximately three months ago, he was switched to the Purina Pro Plan Bright Minds 7-14 and receives 1.5 cup BID. He receives Nexgard and Heartgard. B6

CURRENT MEDICATIONS:

B6

B6

B6

CV/RESP: III/VI left apical systolic murmur, intermittent premature beats ausculted, femoral pulses moderate, no crackles or wheezes on auscultation of lung fields.

B6

DIAGNOSTICS:

B6

3. Thoracic Radiographs * final report pending *

- a. Similar left-sided cardiomegaly with left atrial enlargement and no evidence of cardiac decompensation - consistent with the history of dilated cardiomyopathy.
- b. Similar mild unstructured interstitial pattern - likely age related change or fibrosis.

B6

ASSESSMENT

Thank you for entrusting us with **B6** care, he was a very sweet boy!

Today we performed a recheck echocardiogram to evaluate **B6** cardiac structure and function. We are happy to report that his echo shows significant improvement. His heart remains moderately to severely enlarged, and continues to show evidence of reduced function - but overall has shown significant improvement in the past 3 months. This is great news, and indicates at least some portion of his cardiac changes are responding to a diet change. As we discussed, it is still very possible **B6** has underlying dilated cardiomyopathy secondary to his genetics, but we are very pleased to see this improvement with a diet change. **B6** chest radiographs showed no evidence of heart failure today which is great news. And his kidney panel showed normal values - indicating he is tolerating his medications well. Given these findings, we would like **B6** to continue receiving his medications at their current dosages.

We would like to see **B6** back in 3-4 months for another recheck echocardiogram and chest radiographs. If his heart continues to show improvement, we may be able to discontinue some of his cardiac medications. At this visit, we can also perform a recheck holter monitor, to monitor for any developing arrhythmias. Please continue to monitor him for any signs of worsening cardiac disease - such as lethargy, increased respiratory rate/effort, coughing, weakness, or collapse. If you are concerned about how he is doing, please contact us and have him evaluated by a veterinarian.

INSTRUCTIONS FOR CARE

MEDICATIONS:

B6

RECOMMENDED SUPPLEMENTS:

B6

B6

ACTIVITY:

B6

B6

DIET: We recommend that **B6** continue on his diet of Purina Pro Plan Bright Minds 7-14.

MONITORING:

B6

RECOMMENDATIONS FOR FURTHER EVALUATION:

B6

COMMENTS:

If you have any concerns with how your pet is doing, or to schedule an appointment, please contact the NC State Veterinary Hospital at 919-513-6694. There is a veterinarian on call 24 hours a day.

NOTE: If your pet is in need of emergency aid and you are not able to get to the NC State Veterinary Hospital quickly, please seek care at the nearest veterinary emergency facility. Take these discharge instructions and current medications with you so that the treating veterinarian will know as much as possible regarding your pets' medical condition.

B6

B6

Senior Student:

B6

CLINICIANS:

B6

RESIDENTS:

B6

CLINICAL TECHNICIANS:

B6

RESEARCH TECHNICIAN:

B6

CLIENT SERVICES:

B6

In order to help expedite medication refills, please visit us online at www.ncstatevets.org and select Pet Owners, Pharmacy Refills.

Patient History Report

Client: Phone: Address:	B6	Patient: B6	Breed: Pinscher, Doberman Sex: Neutered Male
		Species: Canine Age: 4 Yrs. 5 Mos. Color: BLACK/BROWN	

Date	Type	Staff	History
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3/22/2018	C	B6	<p>Medical Note Discussed cardiac disease (e.g. DCM and mitral valve disease), medications, exercise, and weight management. B6 Cardiology visit at NSCU. If pet has sudden change or decompensation at home, rec NSCU ER visit for faster Cardiology consult.</p>
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3/22/2018	P	B6	B6
3/22/2018	P	B6	B6
3/22/2018	P	B6	B6

B6	C	B6	<p>Medical Note Report from Animal Emergency Hospital</p>
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B6	C	B6	<p>Medical Note Report from Animal Emergency Hospital</p>
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3/5/2018	V	B6	<p>Mar 5, 2018 02:45 PM Staff: B6 Weight : 93.00 pounds</p>
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B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing Instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative medl note, V: Vital signs

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client
Phone
Address

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates,
I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended,
R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative medi note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TG: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

I:Departing instr, L:Lab result, M:Image cases, P:Prescription, PA:PVL Accepted, PB:problems, PP:PVL Performed, PR:PVL Recommended,
R:Correspondence, T:Images, TC:Tentative medi note, V:Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

I:Departing instr, L:Lab result, M:Image cases, P:Prescription, PA:PVL Accepted, PB:problems, PP:PVL Performed, PR:PVL Recommended,
R:Correspondence, T:Images, TC:Tentative medl note, V:Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B:B
I:Diagnosis, C:Case report, M:Image cases, P:Prescription, PA:PVL Accepted, PB:problems, PP:PVL Performed, PR:PVL Recommended,
R:Correspondence, T:Images, TC:Tentative medl note, V:Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative medl note, V: Vital signs

B6

Page 12 of 13

Date: 5/21/2018 2:30 PM

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative medl note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

5/10/2018 C

B6

Medical Note
Report from NCSU CVM cardiology

5/3/2018 C

B6

Medical Note
Preventive care panel+ = largely WNL. Results emailed to

B6

5/2/2018 L

B6

Chemistry results from IDEXX Reference Laboratory Requisition
ID: 110976938 Posted Final

Test	Result	Reference Range
ALB		2.7 - 3.9
ALKP		5 - 160
ALT		18 - 121
ANION GAP		11 - 26
AST		16 - 55
BICARB		13 - 27
BUN/UREA		9 - 31
Ca		8.4 - 11.8
Chloride		108 - 119
CHOL		131 - 345
CREA		0.5 - 1.5
DBIL		0.0 - 0.1
GGT		0 - 13
GLU		63 - 114
IBIL		0.0 - 0.2
PHOS		2.5 - 6.1
Potassium		4.0 - 5.4
TBIL		0.0 - 0.3
TP		5.5 - 7.5
Sodium		142 - 152
A/G Ratio		0.7 - 1.5
B/C Ratio		
Na/K Ratio		28 - 37
GLOB		2.4 - 4.0
CK		10 - 200
SDMA		0 - 14

B6

Ascn: **B6**

RE: 281 HEMOLYSIS INDEX 1+
Index of N, 1+, 2+ exhibits no significant effect on
chemistry values.

RE: 282 LIPEMIA INDEX 1+
Index of N, 1+, 2+ exhibits no significant effect on
chemistry values.

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I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended,
R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client: Phone: Address:	B6	Patient: B6	Breed: Pinscher, Doberman
		Species: Canine	Sex: Neutered Male
		Age: 4 Yrs. 5 Mos.	
		Color: BLACK/BROWN	

Date Type	Staff	History
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BOTH SDMA AND CREATININE ARE WITHIN THE REFERENCE INTERVAL which indicates kidney function is likely good. Evaluate a complete urinalysis and confirm there is no other evidence of kidney disease.

5/2/2018 L

B6

Test	Result	Reference Range	Posted	Final
T4	B6	1.0 - 4.0		
Asc:	B6			

Interpretive ranges:

- <1.0 Low
- 1.0-4.0 Normal
- >4.0 High
- 2.1-5.4 Therapeutic

Dogs with no clinical signs of hypothyroidism and results within the normal reference range are likely euthyroid. Dogs with low T4 concentrations may be hypothyroid or euthyroid sick. Occasionally, hypothyroid dogs can have T4 concentrations that are low normal. Dogs with clinical signs of hypothyroidism and low or low normal T4 concentrations may be evaluated further by submission of free T4 and canine TSH. A high T4 concentration in a clinically normal dog is likely variation of normal; however elevations may occur secondary to thyroid autoantibodies or rarely thyroid neoplasia. For dogs on thyroid supplement, acceptable 4-6 hour post pill total T4 concentrations generally fall within the higher end or slightly above the reference range.

5/2/2018 L

RB

Test	Result	Reference Range	Posted	Final
BASO	B6			
EOS				
HCT		38.3 - 56.5		
HGB		13.4 - 20.7		

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B6

Patient History Report

Client:	B6	Patient:	B6	Breed:	Pinscher, Doberman
Phone:		Species:	Canine	Sex:	Neutered Male
Address:		Age:	4 Yrs. 5 Mos.	Color:	BLACK/BROWN

Date	Type	Staff	History
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LYMPHS MCH MCHC MCV MONOS NEUT SEG PLATELETS RBC RETIC CNT WBC ABS BASO ABS EOS ABS LYMPHS ABS MONOS ABS NEUTS ABS RET Ascn:	B6	21.9 - 26.1 32.6 - 39.2 59 - 76 143 - 448 5.39 - 8.70 4.9 - 17.6 0 - 100 70 - 1490 1060 - 4950 130 - 1150 2940 - 12670 10 - 110 B6
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AUTOMATED CBC

5/2/2018	C		Medical Note Collected sample for Preventative Care Panel +, sent to Idexx; results are pending. We are evaluating blood sample following pet starting on cardiac medication.
4/20/2018	C		Medical Note <div style="text-align: center; border: 1px dashed black; padding: 5px; font-size: 1.5em;">B6</div>
4/20/2018	P	B6	<div style="text-align: center; border: 1px dashed black; padding: 10px; font-size: 2em;">B6</div>
4/20/2018	C		Medical Note Report from NCSU CVM cardiology
4/11/2018	C		Medical Note <div style="text-align: center; border: 1px dashed black; padding: 10px; font-size: 1.5em;">B6</div>

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Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date	Type	Staff	History
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3/22/2018 C

B6

Medical Note
Discussed cardiac disease (e.g. DCM and mitral valve disease), medications, and prognosis. Cardiology visit at NCSU. If pet has sudden change or decompensation at home, rec NSCU ER visit for faster Cardiology consult.

3/22/2018 P

B6

B6

3/22/2018 P

3/22/2018 P

3/17/2018 C

B6

Medical Note
Report from **B6**

3/11/2018 C

B6

Medical Note
Report from **B6**

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client
Phone
Address

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

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Patient History Report

Client
Phone
Address

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Call back, CR: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B:Billing, C:Med note, CB:Call back, CK:Check-in, CM:Communications, D:Diagnosis, DH:Declined to history, E:Examination, ES:Estimates, I:Departing instr, L:Lab result, M:Image cases, P:Prescription, PA:PVL Accepted, PB:problems, PP:PVL Performed, PR:PVL Recommended, R:Correspondence, T:Images, TC:Tentative medl note, V:Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date	Type	Staff	History
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B6

B: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Billing, C: Med note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: **CANINE**
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

B: Bloodwork, C: Check-out, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing Instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date	Type	Staff	History
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B6

B: Bill, I: Departing inst, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6

Patient History Report

Client:
Phone:
Address:

B6

Patient: **B6**
Species: Canine
Age: 4 Yrs. 5 Mos.
Color: BLACK/BROWN

Breed: Pinscher, Doberman
Sex: Neutered Male

Date Type Staff History

B6

U: Update note, CB: Call back, CK: Check-in, CM: Communications, D: Diagnosis, DH: Declined to history, E: Examination, ES: Estimates, I: Departing instr, L: Lab result, M: Image cases, P: Prescription, PA: PVL Accepted, PB: problems, PP: PVL Performed, PR: PVL Recommended, R: Correspondence, T: Images, TC: Tentative med note, V: Vital signs

B6



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

Network Procedures for Veterinarians

1. Introduction

The purpose of this Network Procedure is to facilitate basic interactions between the Vet-LIRN Program Office (VPO) and veterinarians participating in Vet-LIRN case investigations. General procedures such as information flow, sample handling procedures, submission of reports and billing for services are discussed. The focus of most Vet-LIRN case investigations is on diagnostic samples, although occasionally animal food samples will also be submitted. Animal food testing conducted after receiving a consumer complaint is typically handled by FDA's Office of Regulatory Affairs (ORA) Laboratories or accredited laboratories.

- 1.1 In the case of Vet-LIRN investigations, the government is the client.
 - 1.1.1 The government is requesting assistance in its investigation, and is requesting tests or services to be performed by your clinic during this investigation.
 - 1.1.2 The government will pay for these services.
 - 1.1.3 The owner is helping with the government's investigation of a regulated product.
 - 1.1.4 The goal of the investigation is to determine if the product is at fault and why.
 - 1.1.5 The government's investigation may not provide a definitive diagnosis for the patient's illness.

2. Case Background – Consumer complaint

- 2.1 Vet-LIRN obtains information about the cases we investigate from 3 main sources,
 - 2.1.1 Consumer complaints (cc) - obtained by FDA Consumer Complaint Coordinators by phone
 - 2.1.2 Electronic consumer complaint submissions through FDA's Food Safety Reporting Portal, and
 - 2.1.3 Vet-LIRN partner laboratories.

*NOTE: Generally, the information received in a consumer complaint is **not** kept confidential. In most cases, only protected personal information (such as names and addresses) is withheld in an effort to prevent the complaint from being traced back to the individual who submitted it.*



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

3. Communications

- 3.1 VPO will discuss the case with the referring veterinarian and or the owner.
- 3.2 VPO evaluates the case history and determines a need for follow up testing to determine if the food (or drug) is the cause of the illness or death.
- 3.3 VPO contacts the appropriate member laboratory(-ies) (chosen based on location and capabilities) and provides initial information
 - 3.3.1 In some cases only partial history is available
 - 3.3.2 Follow up information will be sent as it becomes available.
- 3.4 VPO proposes the tests to be conducted and prepares billing documents.
- 3.5 VPO makes arrangements with the veterinarian to obtain and ship samples.
 - 3.5.1 VPO receives test results and forwards the results to the veterinarian who will then communicate the results to the owner.

4. Case history

- 4.1 A complete medical history is essential,
 - 4.1.1 age, sex, breed, animal's ID/name,
 - 4.1.2 other animals affected,
 - 4.1.3 duration of problem, lesion distribution (diagrams or photos are welcome),
 - 4.1.4 treatment of problem (especially dose and duration of therapy) and response to treatment.
 - 4.1.5 concomitant drugs or dietary supplements administered (not used for treatment of the reaction, but administered for other reasons at the same time or within a short time of the problem occurrence).
- 4.2 Vet-LIRN Case Numbers:
 - 4.2.1 Include Vet-LIRN case number in all correspondence.
 - 4.2.2 E-mail: include the Vet-LIRN case number as the first part of the subject line. This will help archiving data for each case.
- 4.3 Electronic submission of medical records and laboratory results is preferred.
- 4.4 Histories can also be submitted by FAX to Vet-LIRN (301-210-4685).
- 4.5 Information about follow-up visits related to the investigation and additional laboratory reports should be provided as soon as possible. Phone calls are very useful for



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

discussing cases in depth, but should be followed up with the medical records and lab reports.

- 4.5.1 Due to time difference around the country, email communication is often the best way to assure information is transferred in a timely manner.

5. Services Requested by VPO

5.1 Services typically tests will fall into 3 categories:

- 5.1.1 Office Examination
- 5.1.2 Clinical laboratory samples
- 5.1.3 Pathology

5.2 Office Examination:

- 5.2.1 To evaluate the current status of the patient.
- 5.2.2 To obtain samples from the patient for further analysis (blood, urine, feces).

5.3 Clinical Laboratory Samples:

- 5.3.1 VPO may ask for repeat analysis of new samples to be run either by the veterinary hospital, or by its usual testing laboratory.
- 5.3.2 Typical tests include clinical hematology, microbial cultures, urinalysis, and fecal examination.
- 5.3.3 Additional testing may be requested and the samples sent to a Vet-LIRN network laboratory.

5.4 Pathology:

- 5.4.1 Either submit the entire carcass or conduct a routine necropsy examination. Record your findings in detail and submit. Histopathology and microbiological cultures as appropriate.
 - 5.4.1.1 Describe all lesions – location, color, size, texture.
 - 5.4.1.2 Culture lesions or intestinal contents as deemed appropriate based on the history.
 - 5.4.1.3 Save tissues for histopathology- be sure to use 10:1 formalin to tissue mass.
- 5.4.2 Histopathology tissues (preserve in 10% neutral buffered formalin 10:1 ratio fixative to tissue):



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

5.4.2.1 thyroid, thymus, lung, heart, liver, spleen, adrenal, kidney, pancreas, stomach, duodenum, jejunum, ileum, colon, urinary bladder, skeletal muscle, brain.

5.4.2.2 Request a duplicate set of H&E for submission to VPO for archiving.

5.5 Toxicology:

5.5.1 Freeze and hold tissues if there is any indication that a toxic substance may be involved:

5.5.1.1 brain (for organophosphates and carbamates),

5.5.1.2 eyes, liver, kidney, brain, stomach content, fat,

5.5.1.3 if available, serum, EDTA blood, urine.

5.5.2 Following a review of histopathology, VPO may select tissues to be analyzed and request that tissues be sent to a Vet-LIRN laboratory.

5.5.3 When the case is closed by VPO, samples can be disposed of. When in doubt, please ask.

5.5.3.1 The animal's remains can be disposed of following the laboratories' customary procedures.

6. Sample submissions

6.1 Normally, VPO prefers that the veterinarian, not the pet owner submit samples.

6.2 Arrangements for transport should be made with the VPO (see additional shipping instructions).

6.3 A Vet-LIRN Sample Submission Form, given by VPO to the veterinarian, should be provided to the veterinarian and should accompany all samples being sent to our Vet-LIRN laboratory, listing the recommended tests.

6.4 A Shipping Inventory Sheet, given by VPO to the veterinarian, should also be provided by VPO and should be submitted with all samples. This form will be filled out and faxed to the VPO (301-210-4685) by the receiving Vet-LIRN laboratory.

6.5 Vet-LIRN case numbers should be provided by the VPO and should be included on all samples and reports.

6.5.1 Rarely, an owner will deliver a specimen or an animal for necropsy directly to the participating laboratory. Vet-LIRN should notify the lab to expect the owner if this happens and will provide appropriate forms.



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

7. Sample types that Vet-LIRN may request from the Veterinarian

- 7.1 Entire bodies (fresh or frozen)
- 7.2 Organs from necropsy (fresh, frozen or formalin fixed)
- 7.3 Clinical samples (serum, blood, urine, feces, biopsy samples, cultures)
- 7.4 Food samples (open bag products from home)

8. Reporting

- 8.1 All reports from Vet-LIRN testing labs are submitted to VPO
- 8.2 VPO will forward reports to the veterinarian, who should discuss the results with the owner.
- 8.3 If appropriate, VPO will forward reports to the owner.

9. Communications with Owners

9.1 General:

- 9.1.1 VPO usually will have contacted the owner to request permission and assistance in the investigation.
- 9.1.2 Vet-LIRN's investigation is focused on determining if a regulated product is the cause of the animal's illness. The testing requested by Vet-LIRN may not provide a definitive diagnosis
- 9.1.3 VPO will provide testing results to the veterinarian for communication to the owner. This ensures that:
 - 9.1.3.1 Owners can be counseled on the interpretation of the test results,
 - 9.1.3.2 Appropriate medical follow-up care based on test results can be recommended by the owner's veterinarian.



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

10. Billing

- 10.1 Vet-LIRN VPO can only pay for services which were requested and approved by VPO. Vet-LIRN cannot pay for treatment, or for diagnostic testing outside of the scope of the investigation.
- 10.2 Procurement and Billing Process: The following process needs to be followed in order to adhere to government regulations.
 - 10.2.1 The veterinarian must provide estimates so a Purchase Request can be prepared. Estimates should include items such as office visit(s), in-house diagnostic test costs, biopsy or pathology costs and additional charges such as potential shipping charges.
 - 10.2.2 A billing contact must be provided: include name, address, telephone + fax numbers, and email.
 - 10.2.3 Approved Purchase Request is required prior to beginning service.
 - 10.2.4 Additional services may only be initiated after authorized by Vet-LIRN, but must first be approved by VPO with an additional Purchase Request.
 - 10.2.5 Hospitals must provide an invoice to Vet-LIRN upon the completion of work before they can be paid. VPO is tax exempt. Taxes should be removed from all charges. The invoice must include the Vet-LIRN case number.



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

Network Procedures for Owners

The purpose of this Network Procedure is to help you, the owner, understand how the Veterinary Laboratory Investigation and Response Network (Vet-LIRN) Program Office conducts case investigations (follow up to consumer complaints).

The following items are explained below:

- General Introduction
- Billing
- Step by Step Process
- Types of Services and Tests

1. General Introduction:

1.1. What is the goal of the case investigation?

The goal of the case investigation is to determine if the product is causing your pet's illness. Our case investigation MAY NOT provide a definitive diagnosis for your pet's illness, although we may rule out several other potential reasons for your pet's illness.

1.2. What is the focus of a case investigation?

Most case investigations focus on diagnostic samples (such as blood, urine or tissue from the pet), although we occasionally request and test pet food samples.

1.3. What is my veterinarian's role during the case investigation?

Your veterinarian helps our investigation into FDA- regulated products by providing information about your pet's medical history and by obtaining any diagnostic samples like blood, urine or tissue.

1.4. What will Vet-LIRN ask of me during a case investigation?

We may ask that your veterinarian perform certain tests or services or provide diagnostic samples to FDA or a Vet-LIRN cooperating laboratory.



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

1.5. Will Vet-LIRN pay for tests or services requested?

Yes, we will pay veterinarians or laboratories *for tests or services requested by Vet-LIRN* and approved through our government purchasing system. We cannot, however, reimburse owners for tests already performed or not specifically requested by Vet-LIRN. We recommend that you discuss with your veterinarian which tests and services will be billed to you and which will be covered by Vet-LIRN. For instance, Vet-LIRN may request that your veterinarian perform a urinalysis on your pet while he or she is hospitalized. Vet-LIRN will pay for the collection and testing of the sample, but would not cover the cost of your pet's stay in the hospital.

1.6. Is the information received in the consumer complaint confidential?

Generally, the information received in the consumer complaint is not kept confidential. In most cases, only protected personal information (such as names and addresses) is withheld in an effort to prevent the complaint from being traced back to the individual who submitted it.

2. Billing:

2.1. Will Vet-LIRN pay for bills related to the case investigation?

Vet-LIRN will cover the cost of services and testing that we specifically request. You should understand that Vet-LIRN *CANNOT* reimburse owners for any veterinary bills. Services *MUST* be pre-authorized and paid directly to the veterinarian.

2.2. Will Vet-LIRN pay for testing that was not requested by Vet-LIRN?

No, we will only pay for testing that we request and authorize.

2.3. Will Vet-LIRN pay for treatments or private cremation?

No, we cannot pay for treatment or cremation.



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

2.4. If I allow my veterinarian to submit my pet's body for testing, will I be able to have back his or her remains?

Each Vet-LIRN member laboratory has its own procedures for handling remains. Some Vet-LIRN member laboratories offer private cremation services for a fee payable directly to the laboratory. We advise you to discuss directly with the member laboratory the possibilities and costs for obtaining your pet's remains after examination are complete.

3. Step by Step Process:

Vet-LIRN will do the following during a case investigation:

- 3.1. Assign a case number which **MUST** be included in all correspondences
- 3.2. Discuss the case with you and your veterinarian
- 3.3. Request medical records from your veterinarian
- 3.4. Coordinate with your veterinarian and you to obtain and submit samples for testing
- 3.5. Provide results to your veterinarian who will discuss the results with you.

Vet-LIRN requests that:

- 3.6. Any follow-up veterinary visits related to the investigation are reported to Vet-LIRN
- 3.7. Additional laboratory reports are reported to Vet-LIRN by your veterinarian.

4. Types of Services and Tests:

4.1. What may a veterinary examination include once the case investigation is started?

A veterinary examination may include:

- an office visit and physical examination to assess your animals current health
- collection of clinical samples from your animal (blood, urine, feces).

4.2. Will your animal be tested more than once?



Network Procedures for Veterinary Laboratory Investigation and Response Network Case Investigations

It is possible that Vet-LIRN may request additional tests or examinations depending on results from initial testing.

4.3. Will Vet-LIRN need to conduct a necropsy in the event of an animal death?

Yes, if you are willing, we may request that your veterinarian or another Vet-LIRN cooperating laboratory to conduct a necropsy to collect samples for testing. The samples collected may be tested right away or may be held for future testing or archiving. If the veterinarian completes the necropsy then the remains will be handled according to the veterinarian's normal procedures. If a Vet-LIRN cooperative laboratory completes the necropsy the remains are usually disposed of by that laboratory. Vet-LIRN cannot pay for private cremation. You are welcome to discuss normal procedures with the laboratory.

4.4. Will Vet-LIRN ask for a food sample?

Our main focus is on testing diagnostic tissue or fluid samples from the animal, but we may need to test the food. Please hold all food samples once the consumer complaint is submitted. If needed, we will make arrangements to collect the food.

4.5. What are some general tests that Vet-LIRN may request?

General tests that we may request include, but are not limited to:

- Hematology
- Microbial cultures
- Urinalysis
- Fecal examination
- Necropsy/Histology/Toxicology

4.6. Will I get results from Vet-LIRN requested tests?

Results of testing on your animal's diagnostic tissue or fluid samples will be forwarded to your veterinarian who will be asked to share the results with you.

Aug. 23. 2018 2:06PM

[B6]

No. 5584 P. 1/4

[B6]

[B6]

[B6]

Referring Veterinarian: previous vet: [B6]

[B6]

08/23/2018 [B6] D.V.M.

[B6]

DOB: [B6]

Sex: FS

Species: Canine

Breed: Australian Shepherd Mix

Weight: 60.8lbs.

Recheck DCM - doing well

S:
Presented for re-evaluation two weeks after referral to Tufts for new diagnosis of DCM
Owner reports [B6] is doing very well at home.
- Earlier resting resp rates were high 30s, most recently rates have been around 20
- Seems improved with cooler weather also.
- Notes her coat is dry
Owner is giving medications as prescribed.

[B6]

[B6]

attn: [B6]

re: followup bloodwork
+ seek recommendation
on reducing [B6]

CVR: II/VI murmur, sinus arrhythmia, LS clear bilaterally

[B6]

A:
Dilated cardiomyopathy - currently well controlled on medication
Mild elevation of BUN

P:
Submitted in-house profile re: renal and liver values
Advised owner will consult with Tufts re: recommendations for continuation of [B6] given slight elevation of

Aug. 23. 2018 2:07PM

B6

No. 5584 P. 2/4

B6

BUN
Given that **B6** is doing well, it is plausible **B6** can be reduced to SID
May supplement with fish oil 200 mg BID for dry coat

For any questions regarding **B6** health, please call **B6**
Anesthesia and medical treatment records are archived in a separate area. Please see hospital staff for assistance.

B6

Aug. 23, 2018 2:07PM

B6

No. 5584 P. 3/4

Client: **B6**
 Patient Name: **B6**
 Species: Canine
 Breed:

Gender:
 Weight: **B6**
 Age: 6 Years
 Doctor: **B6**

B6

Test	Results	Reference Interval	LOW	NORMAL	HIGH
Catalyst One:	B6	(12:45 PM)			
GLU		74 - 143			
CREA		0.5 - 1.8			
BUN		7 - 27			HIGH
BUN/CREA					
PHOS		2.5 - 8.8			
CA		7.9 - 12.0			
TP		5.2 - 8.2			
ALB		2.3 - 4.0			
GLOB		2.5 - 4.5			
ALB/GLOB					
ALT	B6	10 - 125			
ALKP		23 - 212			
GST		0 - 11			
TBIL		0.0 - 0.8			
CHOL		110 - 320			
AMYL		500 - 1500			
LIPA		200 - 1800			
Na		144 - 160			
K		3.5 - 5.8			
Na/K					
Cl		108 - 122			
Corr Calc					

B6

Aug. 23, 2018 2:04PM

B6

No. 5583 P. 1

B6

ANNED

B6

B6

B6

DOB: **B6**

Sex: FS

Referring Veterinarian: previous vet: **B6**

Species: Canine

B6

Breed: Australian Shepherd Mix

Weight: 60.8lbs.

08/23/2018

B6

D.V.M.

Recheck DCM - doing well

S:

Presented for re-evaluation two weeks after referral to Tufts for new diagnosis of DCM

Owner reports: **B6** is doing very well at home.

- Earlier resting resp rates were high 30s, most recently rates have been around 20
- Seems improved with cooler weather also.
- Notes her coat is dry

Owner is giving medications as prescribed:

B6

D:

B6

attn:

B6

re: followup bloodwork

+ Seek recommendation

CVR: II/VI murmur, sinus arrhythmia, LS clear bilaterally

B6

n reducing

B6

A:

Dilated cardiomyopathy - currently well controlled on medication
Mild elevation of BUN

P:

Submitted In-house profile re: renal and liver values

Advised owner will consult with Tufts re: recommendations for continuation of **B6** given slight elevation of

Information for **B6**

Page 1 of 2

Aug. 23. 2018 2:05PM

B6

No. 5583 P. 2

B6

BUN

Given that **B6** is doing well, it is plausible **B6** can be reduced to SID
May supplement with fish oil 200 mg BID for dry coat

For any questions regarding **B6** health, please call: **B6**

Anesthesia and medical treatment records are archived in a separate area. Please see hospital staff for assistance.

B6

Aug. 23, 2018 2:05PM

B6

No. 5583 P. 3

Client: B6
 Patient Name: B6
 Species: Canine
 Breed:

Gender:
 Weight: B6
 Age: 6 Years
 Doctor: B6

B6

Test Results Reference Interval LOW NORMAL HIGH

Catalyst One B6 12:45 PM)

Test	Results	Reference Interval	LOW	NORMAL	HIGH
GLU		74 - 143			
CREA		0.5 - 1.8			
BUN		7 - 27			HIGH
BUN/CREA					
PHOS		2.5 - 6.8			
CA		7.9 - 12.0			
TP		5.2 - 8.2			
ALB		2.3 - 4.0			
GLOB		2.5 - 4.5			
ALB/GLOB					
ALT	B6	10 - 125			
ALKP		23 - 212			
GGT		0 - 11			
TBIL		0.0 - 0.9			
CHOL		110 - 320			
AMYL		500 - 1500			
LIPA		200 - 1800			
Na		144 - 160			
K		3.5 - 5.8			
Na/K					
Cl		109 - 122			
Osm Calc					

B6

Aug. 23. 2018 2:05PM

B6

No. 5583 P. 4

Aug. 6. 2018 6:29PM

B6

No. 3379 P. 1/2

B6

B6

B6

Acct Number:
Address: B6
Phone:
Cell Phone: () - ext:

A
W:() - ext:

Ginger

Medical Alert:
Sex: FS
DOB: B6
Species: Canine
Microchip #:

Weight: 58.1lbs.
Breed: Australian Shepherd Mix

Problem	Date	Diagnosis	Date	Vaccine Name	Date Due
<h1>B6</h1>					

08/06/2018 B6 D.V.M.

Gag / panting excessively

Presented for evaluation of 1-2 week history:

- Panting in unusual contexts ie first thing in the morning without prior exertion
- Occasionally gagging (owner says not coughing) producing small amounts of fluid

Owners had taken B6 on vacation with them about two weeks ago
 She was active and seemed normal while there
 No social contact with other dogs outside the household
 Young dog in household is well
 Hx includes TTA at B6 Vet in 1/2018, no murmur noted at that time

B6

CVR: I/M murmur, pulses weak, HR ~90
RR ~30 breaths per min at rest, panting with minimal exertion

B6

Rads: Cardiomegaly

Aug. 6. 2018 6:29PM

B6

No. 3379 P. 2/2

B6

B6

Pulmonary edema

Concern for pericardial effusion on brief ultrasound scan

Cardiomegaly + pulmonary edema +/- pericardial effusion

Discussed ddx & options with owner for next diagnostic steps

Owner elects immediate referral to Tufts. B6 spoke with ER doctor at Tufts to advise of referral

Administered B6 M prior to departure

For any questions regarding B6 health, please call B6
Anesthesia and medical treatment records are archived in a separate area. Please see hospital staff for assistance.

CARDIOLOGY DIET HISTORY FORM
Please answer the following questions about your pet

Pet's name: **B6** Owner's name: **B6** Today's date: **B6**

- How would you assess your pet's appetite? On a scale of 1-10 with 1 being poor and 10 being excellent: 5 or 6
- Have you noticed a change in your pet's appetite over the last 1-2 weeks? (check all that apply)
 Eats about the same amount as usual Eats less than usual Eats more than usual
 Seems to prefer different foods than usual Other Depends some days she eats good other
- Over the last few weeks, has your pet (check one)
 Lost weight Gained weight Stayed about the same weight Don't know
- Please list below ALL pet foods, people food, treats, snack, dental chews, rawhides, and any other food item that your pet currently eats. Please include the brand, specific product, and flavor so we know exactly what you pet is eating.

Food (include specific product and flavor) Form Amount How often? Fed since
Examples are shown in the table – please provide enough detail that we could go to the store and buy the exact same food

Food (include specific product and flavor)	Form	Amount	How often?	Fed since
Nutro Grain Free Chicken, Lentil, & Sweet Potato Adult	dry	1 1/2 cup	2x/day	Jan 2018
85% lean hamburger	microwaved	3 oz	1x/week	Jan 2015
Pupperoni original beef flavor	treat	1/2	1x/day	Aug 2015
Rawhide	treat	6 inch twist	1x/week	Dec 2015
Rachel Ray nutritis real beef and brown rice barcode 7119000095	Dry	2 cups	2x day	Jan 2017
Bully sticks		1	Day	Jan 2012
Marrow bones frozen		1	1x week	Jan 2012
Peanut butter skippy brand		1 tablespoon	3x week	Jan 2012
Dentalix pedigree mint flavor		1	1x day	Jan 2012

***Any additional diet information can be listed at the bottom of this sheet**

- Do you give any dietary supplements to your pet (for example: vitamins, glucosamine, fatty acids, or any other supplements)? Yes No If yes, please list which ones and give brands and amounts:

Taurine	<input type="radio"/> Yes <input checked="" type="radio"/> No	Brand/Concentration	Amount per day
Carnitine	<input type="radio"/> Yes <input checked="" type="radio"/> No	_____	_____
Antioxidants	<input type="radio"/> Yes <input checked="" type="radio"/> No	_____	_____
Multivitamin	<input type="radio"/> Yes <input checked="" type="radio"/> No	_____	_____
Fish oil	<input type="radio"/> Yes <input checked="" type="radio"/> No	_____	_____
Coenzyme Q10	<input type="radio"/> Yes <input checked="" type="radio"/> No	_____	_____
Other (please list):			
Example: Vitamin C		Nature's Bounty	500 mg tablets – 1 per day
_____		_____	_____
_____		_____	_____
_____		_____	_____

- How do you administer pills to your pet?
 I do not give any medications I put them directly in my pet's mouth without food
 I put them in my pet's dog/cat food I put them in a Pill Pocket or similar product
 I put them in foods (list foods): _____

Additional diet or supplement information: _____

Information below to be completed by the veterinarian:
 Current body weight: _____ kg Current body condition score (1-9): ____/9
 Muscle Condition Score: normal muscle mild muscle loss moderate muscle loss severe muscle loss

B6

Weight: 58.1lbs.
Breed...: Australian Shepherd Mix

Cell Phone...: () - ext: Species...: Canine
Microchip # :

<u>Problem</u>	<u>Date</u>	<u>Diagnosis</u>	<u>Date</u>	<u>Vaccine Name</u>	<u>Date Due</u>
				Rabies	05/03/2017!
				DA2PP	
				Leptospirosis	
				Heartworm Test	01/23/2019
				Bordetella Vaccine	
				Physical Exam	
				Lyme Vaccine	
				Influenza Vaccine	
				Distemper/Parvo Titers	
				Corona Vaccine	

08/06/2016 **B6**

Gag / panting excessively

Presented for evaluation of 1-2 week history:

- Panting in unusual contexts ie first thing in the morning without prior exertion
- Occasionally gagging (owner says not coughing) producing small amounts of fluid

Owners had taken **B6** on vacation with them about two weeks ago

She was active and seemed normal while there

No social contact with other dogs outside the household

Young dog in household is well

Hx includes TTA **B6** 1/2018, no murmur noted at that time

B6

CVR: **ll/M** murmur, pulses weak, HR ~90

RR ~30 breaths per min at rest, panting with minimal exertion

B6

Rads: Cardiomegaly

Information for **B6**
Page 1 of 2

B6

No. 3379 P. 2/2

Pulmonary edema

Concern for pericardial effusion on brief ultrasound scan

Cardiomegaly + pulmonary edema +/- pericardial effusion

Discussed ddx & options with owner for next diagnostic steps

Owner elects immediate referral to Tufts. MKP spoke with ER doctor at Tufts to advise of referral

Administered **B6** prior to departure

For any questions regarding **B6** health, please call **B6**
Anesthesia and medical treatment records are archived in a separate area. Please see hospital staff for assistance.

CARDIOLOGY DIET HISTORY FORM
Please answer the following questions about your pet

Pet's name: **B6** Owner's name: **B6** Today's date: 9/6/18

- How would you assess your pet's appetite? On a scale of 1-10 with 1 being poor and 10 being excellent: 5 or 6
- Have you noticed a change in your pet's appetite over the last 1-2 weeks? (check all that apply)
 Eats about the same amount as usual Eats less than usual Eats more than usual
 Seems to prefer different foods than usual Other Depends some days she eats good one
- Over the last few weeks, has your pet (check one)
 Lost weight Gained weight Stayed about the same weight Don't know
- Please list below ALL pet foods, people food, treats, snack, dental chews, rawhides, and any other food item that your pet currently eats. Please include the brand, specific product, and flavor so we know exactly what you pet is eating.

Food (include specific product and flavor) Form Amount How often? Fed since
Examples are shown in the table – please provide enough detail that we could go to the store and buy the exact same food

Food (include specific product and flavor)	Form	Amount	How often?	Fed since
Nutro Grain Free Chicken, Lentil, & Sweet Potato Adult	dry	1 1/2 cup	2x/day	Jan 2018
85% lean hamburger	microwaved	3 oz	1x/week	Jan 2015
Pupperoni original beef flavor	treat	1/2	1x/day	Aug 2015
Rawhide	treat	6 inch twist	1x/week	Dec 2015
Rachel Ray nutritish real beef and brown rice barcode 7119000095	Dry	2 cups	2x day	Jan 2017
Bully sticks		1	Day	Jan 2018
Marrow bones frozen		1	1x week	Jan 2018
Peanut butter skippy brand		1 tablespoon	3x week	Jan 2018
Dentalix pedigree mint flavor		1	1x day	Jan 2018

***Any additional diet information can be listed at the bottom of this sheet**

- Do you give any dietary supplements to your pet (for example: vitamins, glucosamine, fatty acids, or any other supplements)? Yes No If yes, please list which ones and give brands and amounts:

	Brand/Concentration	Amount per day
Taurine	<input type="radio"/> Yes <input checked="" type="radio"/> No _____	_____
Carnitine	<input type="radio"/> Yes <input checked="" type="radio"/> No _____	_____
Antioxidants	<input type="radio"/> Yes <input checked="" type="radio"/> No _____	_____
Multivitamin	<input type="radio"/> Yes <input checked="" type="radio"/> No _____	_____
Fish oil	<input type="radio"/> Yes <input checked="" type="radio"/> No _____	_____
Coenzyme Q10	<input type="radio"/> Yes <input checked="" type="radio"/> No _____	_____
Other (please list): Example: Vitamin C	Nature's Bounty	500 mg tablets – 1 per day
_____	_____	_____
_____	_____	_____
_____	_____	_____

- How do you administer pills to your pet?
 I do not give any medications I put them directly in my pet's mouth without food
 I put them in my pet's dog/cat food I put them in a Pill Pocket or similar product
 I put them in foods (list foods): _____

Additional diet or supplement information: _____

Information below to be completed by the veterinarian:
 Current body weight: _____ kg Current body condition score (1-9): ____/9

Muscle Condition Score: normal muscle mild muscle loss moderate muscle loss severe muscle loss

CVCA, Cardiac Care for Pets

B6

Email: cvcaa **B6** @cvcavets.com
www.cvcavets.com



Client: **B6**

Co-owner:

Patient name: **B6**

Species: Canine

Breed: Labrador Retriever

Sex: FS

Age: **B6** years and **B6** months old

Weight: 33.18kg / 73.15 lbs

Primary Care Veterinarian: **B6**

Primary Care Hospital: **B6**

Phone: **B6** ext:

Fax: **B6**

Email:

Cardiac Evaluation Report
Exam Date: 10/31/2017

Diagnosis

- Advanced dilated cardiomyopathy - ruleout idiopathic vs. taurine-responsive
- Mild to moderate mitral valve regurgitation as cause of heart murmur
- Trace tricuspid valve regurgitation
- Moderate to severe left atrial chamber dilation
- Severe eccentric left ventricular chamber dilation
- Moderate to severe decrease in contractility/heart muscle function
- Mild left ventricular wall thinning
- Mild right atrial and right ventricular chamber dilation
- Progressive cough - rule out: early left sided congestive heart failure vs. mainstem bronchial compression

B6

- Please call if you notice a decrease in appetite, vomiting, lethargy, weakness or any other signs of illness while beginning/adjusting the medications.
- Continue with monthly heartworm and flea/tick control as prescribed by **B6**

In 2 weeks, if **B6 is eating and feeling well:**

- Begin **B6** - Give 1 tablet once daily for 4 days then increase to 1 tablet twice daily thereafter.

Information for **B6**

CVCA **B6** 03/27/2018

- Begin Taurine 1500 mg twice daily.
- Begin L-carnitine 1500 mg three times daily.
- You may purchase the taurine and L-carnitine at any health food or nutrition store on www.puritanspride.com. You may also obtain the L-carnitine in bulk powder form from North Carolina State University by calling 919-513-6325.

Please allow 24-48 hours for CVCA to process prescription refill requests.

Refill all medications indefinitely unless directed by CVCA or your primary care veterinarian.

- Please check all medications and dosages on your discharge report against the pharmacy labels.

Please Note

- Please see our website www.cvcavets.com for more information about **B6** dilated cardiomyopathy.

Nutrition Recommendations:

B6

Activity Recommendations:

B6

At Home Monitoring:

B6

Future Anesthesia/Fluid Recommendations

B6

Reevaluation

- Please recheck with **B6** Veterinary Clinic in the next day or two to obtain taurine levels. Please forward these results when available.
- Please recheck with **B6** Veterinary Clinic in 2 weeks for a follow up examination and blood chemistry profile with electrolytes and as recommended by **B6**. Please forward these results when available.
- Please recheck with **B6** Veterinary Clinic every 4-6 months for a follow up examination and blood chemistry profile with electrolytes and as recommended by **B6**. Please forward these results when available.
- Please recheck with CVCA in 5 months for a follow up consultation/examination, blood pressure, and echocardiogram. Please contact us or schedule an earlier appointment if **B6** has any problems or symptoms indicative of worsening heart disease or if recommended by **B6**.

Visit Summary

Heart Rate: 132 bpm

BP: 100mmHg (based on MR gradient)

History:

B6 developed a cough last Wednesday (10/25/17). Radiographs and blood work were performed by **B6** Veterinary Clinic. The lab work (which is unavailable for review) reportedly showed an elevated ALP, **B6** and GGT, **B6** and mild lymphopenia. Thoracic radiographs were performed which revealed cardiomegaly. **B6** was treated with **B6**. All medications were stopped on Monday as her cough had worsened and she was presented to the **B6** for a cardiac evaluation as her coughing had worsened and she had brought up a small volume of pink-tinged foam after a coughing fit. During this time there has been no evidence of lethargy and she continues to eat and drink normally at home.

PPHx: None

Meds: None

Other: UTD on vaccinations, On HW preventative

Diet: Zignature (Kangaroo)

Physical Exam Findings:

B6

H/L: Grade 2/6 left apical protosystolic heart murmur, regular rhythm, strong synchronous femoral pulses, RR: 36 breaths/min, questionable mild increase in bronchovesicular sounds bilaterally, no crackles or wheezes ausculted, eupneic

B6

Other Diagnostics:

10/27/17 pDVM CXR: Generalized cardiomegaly characterized by widening of the cardiac silhouette and loss of the caudal cardiac waist consistent with left atrial enlargement. Slight left auricular bulge. Increased sternal contact and rounding of the right heart on the VD radiograph. Dorsal deviation of the trachea. Prominent pulmonary vasculature with a questionable mild increase in interstitial opacity in the caudodorsal lung fields which may suggest early congestive heart failure/pulmonary edema.

Echocardiographic Findings

Severe left ventricular eccentric hypertrophy with apical rounding and increased sphericity, mild-moderate centrally

located mitral regurgitant jet, moderate-severe secondary left atrial dilation on 2D imaging and moderately-severely increased LA:Ao ratio on M-mode imaging, mild eccentric low velocity tricuspid regurgitation with mildly elevated estimated right ventricular pressures consistent with mild pulmonary hypertension, mild right ventricular and right atrial dilation, normal left and right ventricular outflow velocities, moderately to severely depressed indices of systolic function (FS% and EF% by modified Simpson's - LVDI [B6] increased EPSS, elevated transmitral inflow velocities and E:A wave ratio on spectral Doppler tracings, normal TDI E':A' ratio of the lateral mitral annulus, no masses, effusions or heartworms observed.
ECG during echocardiogram: Normal sinus rhythm. No ventricular ectopy noted.

Comments

Dear [B6]

Thank you for sending [B6] to see us with [B6] today. Sadly, [B6] has dilated cardiomyopathy with moderate to severe systolic dysfunction and moderate to severe left atrial dilation. This places her at a high risk of developing congestive heart failure and with the progression in her cough I am concerned that we may be dealing with congestive heart failure at this time. We have begun therapy to control congestive heart failure, support cardiac function, slow down the progression of the heart disease and improve survival. We are now seeing more dogs on specialized diets that are developing taurine deficiency and we have discussed submission of taurine levels to evaluate whether this may be a contributing factor to [B6] condition. [B6] is interested in pursuing this test at your clinic, taurine levels should be drawn and placed in a heparinized tube (green top) and should be frozen and submitted to [B6] (who sends it to UC Davis). It will be interesting to see if this is a contributing factor to [B6] condition.

We will continue to closely monitor [B6] heart disease via serial echocardiography and institute further therapy when progression is noted. While on this course of medication, it is important to monitor the chemistry profiles and blood pressures. Dogs with dilated cardiomyopathy are at a higher risk of developing ventricular arrhythmias. None were noted today; however, it will be important to monitor for arrhythmias periodically in the future. Unfortunately, the prognosis is guarded after the onset of congestive heart failure, and we discussed with the [B6] family that the average survival is ~ 6-12 months.^{1,2} Survival time is highly individually variable depending on response to therapy.

We appreciate your continued referrals and the trust you place in CVCA to co-manage your cardiac patients. We look forward to working with you on this case and others. In an effort to continue to improve CVCA's service to both you and your clients, please visit our website at www.cvcavets.com and complete our online referring veterinarian survey.

Sincerely,

[B6] VMD, DACVIM - Cardiology

CVCA, Cardiac Care for Pets

B6



Email: cvca **B6** @cvcavets.com
www.cvcavets.com

Client: **B6**
Co-owner:
Patient name: **B6**
Species: Canine
Breed: Labrador Retriever
Sex: FS
Age: **B6** years and **B6** months old
Weight: 33.18kg / 73.15 lbs

Primary Care Veterinarian: **B6**
Primary Care Hospital: **B6**
Phone: **B6** ext:
Fax: **B6**
Email:

Cardiac Evaluation Report
Exam Date: 02/26/2018

Diagnosis

- Mild, improved dilated cardiomyopathy - suspect taurine-responsive
- Mild, improved mitral and very mild tricuspid valve regurgitation as cause of heart murmur
- Normal, improved left atrial chamber dilation
- Mild, improved eccentric left ventricular chamber dilation
- Low normal, improved left ventricular contractility/heart muscle function
- Cough - suspect bronchial/primary respiratory disease

Medications

B6

- Continue with monthly heartworm and flea/tick control as prescribed by **B6**

Please allow 24-48 hours for CVCA to process prescription refill requests.

Refill all medications indefinitely unless directed by CVCA or your primary care veterinarian.

- Please check all medications and dosages on your discharge report against the pharmacy labels.

Please Note

- Please see our website www.cvcavets.com for more information about **B6** dilated cardiomyopathy.

Information for **B6**

CVCA **B6** 03/27/2018

Nutrition Recommendations:

B6

Activity Recommendations:

B6

At Home Monitoring:

B6

Future Anesthesia/Fluid Recommendations:

B6

Reevaluation

- Recheck with **B6** Veterinary Clinic in the next 2-4 weeks and every 6 months for wellness care as directed, close auscultation, blood pressure and complete lab tests including blood and urine testing (CBC/Chemistry/Urinalysis/Thyroid evaluation). Please forward these results when available.
- Please recheck with CVCA in 6 months for a follow up consultation/examination, blood pressure, and echocardiogram. Please contact us or schedule an earlier appointment if **B6** has any problems or symptoms indicative of worsening heart disease or if recommended by **B6**

We thank you for trusting in CVCA to care for **B6** today. Please do not hesitate to call us with any questions or concerns.

Sincerely,

- B6** DVM, DACVIM - Cardiology
- B6** RVT, Team Leader
- B6** RVT (Registered Veterinary Technician)
- B6** Veterinary Nurse
- B6** Client Service Representative

Visit Summary

Heart Rate: 130

BP: 155 mmHg

Cuff Size/Location: 6 cuff/LF

History: Recheck DCM, suspected early CHF; doing well; RRR - 16 bpm, increased **B6** in January due to increased cough; cough seems to be intermittent and related to excitement; good appetite; 3 kg weight gain since 10/2017; walks 30-45 minutes per day - slow pace, at times winded but recovers very quickly.

Information for **B6**

CVCA **B6** 03/27/2018

B6 developed a cough last Wednesday (10/25/17). Radiographs and blood work were performed by **B6** Veterinary Clinic. The lab work (which is unavailable for review) reportedly showed an elevated ALP **B6** and GGT **B6** and mild lymphopenia. Thoracic radiographs were performed which revealed cardiomegaly. **B6** was treated with **B6**. All medications were stopped on Monday as her cough had worsened and she was presented to the **B6** for a cardiac evaluation as her coughing had worsened and she had brought up a small volume of pink-tinged foam after a coughing fit. During this time there has been no evidence of lethargy and she continues to eat and drink normally at home.

PPHx: None
Meds: None
Other: UTD on vaccinations, On HW preventative
Diet: changed from Zignature (Kangaroo) to Royal Canin Early Cardiac

Physical Exam Findings: 3/6 pansystolic murmur, PMI - mitral valve, regular rhythm with S3 gallop; LUNGS - clear all fields, panting, normal effort; SI. overweight body condition (BCS - 6/9); Pink mm; PP - SS; PLN - WNL; ABD - hepatomegaly; BAR

Echocardiographic Findings

Mild left ventricular eccentric dilation - significant improvement compared to previous exam; mild, improved centrally located mitral regurgitant jet, normal, improved left atrial dimensions on 2D imaging and on M-mode imaging, mild, low velocity eccentric low velocity tricuspid regurgitation, subjectively normal right ventricular and right atrial dimensions, normal left and right ventricular outflow velocities, low normal, improved indices of systolic function (FS% and EF% by modified Simpson's, normal EPSS, normal transmitral inflow velocities and E:A wave ratio on spectral Doppler tracings, normal TDI E':A' ratio of the lateral mitral annulus, no masses, effusions or heartworms observed.

Comments

Dear **B6**

Thank you for sending **B6** to see us with **B6** today. I am quite pleased with **B6** exam today. She has had remarkable improvement in her echocardiogram with the cardiac medications, change in diet and supplementation with Taurine and L-carnitine. Her risk for congestive heart failure at this point is very low so we will be weaning **B6** off the **B6** a while **B6** monitors **B6** respiratory rate. Her current cough is likely due to **B6** Right **B6** now, with the marked improvement **B6** long-term prognosis has improved considerably. I suspect we will be able to further discontinue cardiac medications if her heart remains stable. We will continue to closely monitor **B6** heart disease via serial echocardiography and institute further therapy when progression is noted. While on this course of medication, it is important to monitor the chemistry profiles and blood pressures. Hopefully, **B6** will continue to do so well - she's a sweetie!

We appreciate your continued referrals and the trust you place in CVCA to co-manage your cardiac patients. We look forward to working with you on this case and others. In an effort to continue to improve CVCA's service to both you and your clients, please visit our website at www.cvcavets.com and complete our online referring veterinarian survey.

Sincerely,

B6 DVM, DACVIM - Cardiology

11/10/17 09:05:38

B6

->

B6

Page 001

B6

B6

Account: 21487

Owner: B6
 Patient:
 Species: CANINE
 Breed: LABRADOR_RETRIE
 Age: 11Y
 Gender: FS

Requisition #: 107481388
 Accession #: B6
 Order rec'd: 11/03/2017
 Ordered by: B6
 Reported: 11/10/2017

TAURINE (WHOLE BLOOD)

Test		Result		
TAURINE	B6	(200 - 350)	L	B6
Testing performed at University of California, Davis				

B6

11/10/2017

FINAL REPORT

PAGE 1 OF 1

From: PFR Event <pfpreventcreation@fda.hhs.gov>
To: Cleary, Michael *; HQ Pet Food Report Notification; B6
Sent: 10/8/2018 5:44:37 PM
Subject: Acana Heritage formula dog food (mostly freshwater fish: Lisa Freeman - EON-367839
Attachments: 2055788-report.pdf; 2055788-attachments.zip

A PFR Report has been received and PFR Event [EON-367839] has been created in the EON System.

A "PDF" report by name "2055788-report.pdf" is attached to this email notification for your reference. Please note that all documents received in the report are compressed into a zip file by name "2055788-attachments.zip" and is attached to this email notification.

Below is the summary of the report:

EON Key: EON-367839

ICSR #: 2055788

EON Title: PFR Event created for Acana Heritage formula dog food (mostly freshwater fish free run poultry and meats (beef pork and lamb) formulas. Also Meadowlands; 2055788

AE Date	10/04/2018	Number Fed/Exposed	1
Best By Date		Number Reacted	1
Animal Species	Dog	Outcome to Date	Stable
Breed	Great Dane		
Age	B6 Years		
District Involved	PFR-New England DO		

Product information

Individual Case Safety Report Number: 2055788

Product Group: Pet Food

Product Name: Acana Heritage formula dog food (mostly freshwater fish, free run poultry, and meats (beef, pork, and lamb) formulas. Also, Meadowlands

Description: Murmur identified by RDVM 7/17/18. Asymptomatic. DCM diagnosed 10/4/18. Has been eating Acana diet. Owner is happy to talk to FDA and to provide more info. Taurine levels pending. Details on diet and treats below: I can tell you, for starters, that B6 was put on a Fromm diet from July of 2015 thru about March

of 2016. Since that period, she has been eating only Acana Heritage formula dog food. This contains "0% grain, potato, gluten, meat by-products, and plant protein concentrates" as listed on their label. She has had a variety of flavors from this brand. Primarily, it has been "freshwater fish", "free run poultry", and "meats formula" (beef, pork, and lamb) **B6** has also had multiple bags of Acana "meadowland" which is advertised as poultry, fish, and eggs. I have also discovered that all of her treats have been produced by Acana. One is labeled as macarel and greens, another is poultry and monkfish, and the last is lamb, liver, and tripe. I should be able to get some records from our local pet store as they have a rewards program we are part of and all of our purchases from the last three years are on our account.

Submission Type: Initial

Report Type: Adverse Event (a symptom, reaction or disease associated with the product)

Outcome of reaction/event at the time of last observation: Stable

Number of Animals Treated With Product: 1

Number of Animals Reacted With Product: 1

Product Name	Lot Number or ID	Best By Date
Acana Heritage formula dog food (mostly freshwater fish, free run poultry, and meats (beef, pork, and lamb) formulas. Also, Meadowlands		

Sender information

Lisa Freeman
200 Westboro Rd
North Grafton, MA 01536
USA

Owner information

B6
USA

To view this PFR Event, please click the link below:

<https://eon.fda.gov/eon//browse/EON-367839>

To view the PFR Event Report, please click the link below:

<https://eon.fda.gov/eon//EventCustomDetailsAction!viewReport.jspx?decorator=none&e=0&issueType=12&issueId=384761>

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Client: **B6**
Patient: **B6**

IDEXX BNP - 1/15/2019

B6

Client: **B6** Patient: **B6**

Client: **B6**
Patient: **B6**
Species: CANINE
Breed: GREAT_DANE
Gender: FEMALE S PAVED
Age: 3Y

Date: 01/15/2019
Requisition #: 423585
Accession #: **B6**
Ordered by: RUSH

IDEXX VetConnect 1-888-433-9967
TUFTS UNIVERSITY
200 WESTBORO RD
NORTH GRAFTON, Massachusetts 01536
508-839-5395
Account #88933

CARDIOPET proBNP - CANINE

Test	Result	Reference Range	Unit	Method	Flag
CARDIOPET proBNP - CANINE	B6	0 - 900 pmol/L	HIGH		B6

Comments:

B6

Please note: Complete interpretive comments for all concentrations of Cardiotet proBNP are available in the online directory of services. Serum specimens received at room temperature may have decreased NT-proBNP concentrations.

Client:
Patient:

B6

Chem 1/15/2019



Tufts Cummings School Of Veterinary Medicine

200 Westboro Road
North Grafton, MA 01536

DUPLICATE

Name/DOB:	B6	Sex: SF	Provider: Dr. John Rush
Patient ID:		Age: 3	Order Location: V320559: Investigation into
Phone number:		Species: Canine	Sample ID: 1901150061
Collection Date: 1/15/2019 11:07 AM		Breed: Great Dane	
Approval date: 1/15/2019 12:23 PM			

Research Chemistry Profile - Small Animal (Cobas)

		Ref. Range/Females
CSTCYR		
Glucose		67-135 mg/dL
Urea		8-30 mg/dL
Creatinine		0.6-2.0 mg/dL
Phosphorus		2.6-7.2 mg/dL
Calcium 2		9.4-11.3 mg/dL
Magnesium 2+		1.8-3.0 mEq/L
Total Protein		5.5-7.8 g/dL
Albumin		2.8-4.0 g/dL
Globulins		2.3-4.2 g/dL
A/G Ratio		0.7-1.6
Sodium		140-150 mEq/L
Chloride		106-116 mEq/L
Potassium		3.7-5.4 mEq/L
tCO2(Bicarb)		14-28 mEq/L
AGAP		8.0-19.0
NA/K		29-40
Total Bilirubin		0.10-0.30 mg/dL
Alkaline Phosphatase		12-127 U/L
GGT		0-10 U/L
ALT		14-86 U/L
AST		9-54 U/L
Creatine Kinase		22-422 U/L
Cholesterol		82-355 mg/dL
Triglycerides		30-338 mg/dl
Amylase		409-1250 U/L
Osmolality (calculated)		291-315 mmol/L

B6

Sample ID: 1901150061/1
REPRINT: Orig. printing on 1/15/2019 (Final)

Reviewed by: _____

Client: **B6**
 Patient:

Diet Hx 4/18/19

B6

CARDIOLOGY DIET HISTORY FORM
 Please answer the following questions about your pet

Pet's name: **B6** Owner's name: **B6** Today's date: 4/18/19

1. How would you assess your pet's appetite? (mark the point on the line below that best represents your pet's appetite)
 Example: **Poor** _____ | _____ **Excellent**

Poor _____ | _____ **Excellent**
 X

2. Have you noticed a change in your pet's appetite over the last 1-2 weeks? (check all that apply)
 Eats about the same amount as usual Eats less than usual Eats more than usual
 Seems to prefer different foods than usual Other _____

3. Over the last few weeks, has your pet (check one)
 Lost weight Gained weight Stayed about the same weight Don't know

1. Please list below ALL pet foods, people food, treats, snack, dental chews, rawhides, and any other food item that your pet currently eats and that you have fed in the last 2 years.

Please provide enough detail that we could go to the store and buy the exact same food - examples are shown in the table

Food (include specific product and flavor)	Form	Amount	How often?	Dates fed
Nutro Grain Free Chicken, Lentil, & Sweet Potato Adult	dry	1 1/2 cup	2x/day	Jan 2016-present
85% lean hamburger	microwaved	3 oz	1x/week	June -Aug 2016
Pupperoni original beef flavor	treat	1/2	1x/day	Sept 2016-present
Rawhide	treat	6 inch twist	1x/week	Dec 2018-present
<i>Royal Canin Fatty Acidic</i>	<i>dry</i>	<i>3 cups</i>	<i>2x/day</i>	<i>Oct 2018-present</i>
<i>Beebeespresso all natural PB unsalted</i>	<i>treat</i>	<i>3+tblsp</i>	<i>2x/week</i>	<i>2015-present</i>

*Any additional diet information can be listed on the back of this sheet

2. Do you give any dietary supplements to your pet (for example: vitamins, glucosamine, fatty acids, or any other supplements)? Yes No If yes, please list which ones and give brands and amounts:

	Brand/Concentration	Amount per day
Taurine <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Carnitine <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Antioxidants <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Multivitamin <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Fish oil <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Coenzyme Q10 <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Other (please list): Example: Vitamin C	<i>Nature's Bounty</i>	<i>500 mg tablets - 1 per day</i>

3. How do you administer pills to your pet?
 I do not give any medications
 I put them directly in my pet's mouth without food
 I put them in my pet's dog/cat food
 I put them in a Pill Pocket or similar product
 I put them in foods (list foods): peanut butter or cheese

Client: **B6**
Patient: **B6**

NT-proBNP 4/18/2019

IDEXX Reference Laboratories

Client **B6** Patient **B6**

Client: **B6**
Patient: **B6**
Species: CANINE
Breed: GREAT_DANE
Gender: FEMALE S/PAYED
Age: 5Y

Date: 04/18/2019
Requisition #: LA
Accession #: **B6**
Ordered by: **B6**

IDEXX VetConnect 1-888-433-9967
TUFTS UNIVERSITY
200 WESTBORO RD
NORTH GRAFTON, Massachusetts 01536
508-839-5395
Account: **B6**

CARDIOPET proBNP - CANINE

Test	Result	Reference Range	Unit	Method	Flag
CARDIOPET proBNP - CANINE	B6	0 - 900 pmol/L	HIGH		B6

Comments:

1. Cardiac test proBNP result is **B6**.

B6

Please note: Complete interpretive comments for all concentrations of CardioPET proBNP are available in the online directory of services. Serum specimens received at room temperature may have decreased NT-proBNP concentrations.

Client: **B6**
Patient:

Troponin 5/31/2019



Gastrointestinal Laboratory
Dr. J.M. Steiner
Department of Small Animal Clinical Sciences
Texas A&M University
4474 TAMU
College Station, TX 77843-4474



Website User ID: **B6**

GI Lab Assigned Clinic ID: 23523

B6
Tufts Cummings School of Vet Med - Cardiology/Nutrition
200 Westboro Road
North Grafton, MA 01536
USA

Phone: 508 887 4696
Fax:
Animal Name: **B6**
Owner Name:
Species: Canine
Date Received: May 30, 2019

Tufts Cummings School of Vet Med -
Cardiology/Nutrition Tracking Number:
423595

GI Lab Accession: **B6**

Test	Result	Reference Interval	Assay Date
Ultra-Sensitive Troponin I Fasting	B6 ng/mL	≤0.06	05/31/19

B6

Comments:

GI Lab Contact Information

Phone: (979) 862-2861
Fax: (979) 862-2864

Email: gilab@cvm.tamu.edu
vetmed.tamu.edu/gilab

B6

B6

B6

B6

Echocardiography Examination Report

Patient ID: B6	Exam Date: 01/30/2018
Client Name: B6	
Pet name	
Age: 2	
Breed	Cardiologist:
Weight: 31.3 kg	
Sex: Female	

CARDIAC DIAGNOSES AND ASSESSMENT:

DCM with severe dilation and reduced systolic function;	B6
B6	

RECOMMENDATIONS:

Poor prognosis; at risk for worsening edema, atrial fibrillation or VT, or sudden death; aki

MEDICAL HISTORY

signs of exercise intolerance, cough, 7-10 d ago, incre RR approx 3-5 d ago, somewhat improved post therapy but still increased breathing rate today

STUDY INDICATION:

cardiac consultation

CARDIOVASCULAR EXAMINATION:

B6

ECHOCARDIOGRAPHIC FINDINGS:

B6

RADIOGRAPHY AND OTHER IMAGE FINDINGS

B6

B6

1086750

Page 2 of 3

B6

B6

MEASUREMENTS

2D	M-Mode	DOPPLER
Ao Diam LA Diam LA/Ao	IVSd LVIDd LVPWd IVSs LVIDs LVPWs EDV(Teich) ESV(Teich) EF(Teich) %FS SV(Teich) Time HR	MV E Vel MV E Vel MV DecT MV A Vel MV E/A Ratio Septal E' E/Septal E' MV DecT PV Vmax PV maxPG TR Vmax TR maxPG
B6	B6	B6

IMAGES:

IMAGES:



Cardiac sonographer:

Operator Name **B6** DVM, DACVIM /
DECVIM (Cardiology)

Reviewed by:

INGREDIENT ISSUES *Greg Aldrich, PhD*

Legume seed oligosaccharides: How much is just right in dog and cat diets?



Working with legume seeds has its advantages for pet food, but the oligosaccharide concentrations that come with them must be taken into consideration. *S.Piyasat / iStockphoto.com*

With the popularity of grain-free diets, large concentrations of oligosaccharides are being introduced into dog and cat

foods. The legume seeds such as peas, lentils, chickpeas and various beans are the leading sources. These legume seeds bring great variety to the pet aisle, have more protein than the cereal grains,

B4

B4

B4

Dr. Aldrich is president of Pet Food & Ingredient Technology Inc. He is also the author of *Petfood Industry* magazine's monthly column, "Ingredient Insights."

B6



Client: **B6**
Co-owner:
Patient name: **B6**
Species: Canine
Breed: Labrador Retriever
Sex: FS
Age: **B6**
Weight: 33.18kg / 73.15 lbs

Primary Care Veterinarian: **B6**
Primary Care Hospital: **B6**
Phone: **B6** ext:
Fax:
Email:

Cardiac Evaluation Report

Exam Date: 02/26/2018

Diagnosis

- Mild, improved dilated cardiomyopathy - suspect taurine-responsive
- Mild, improved mitral and very mild tricuspid valve regurgitation as cause of heart murmur
- Normal, improved left atrial chamber dilation
- Mild, improved eccentric left ventricular chamber dilation
- Low normal, improved left ventricular contractility/heart muscle function
- Cough - suspect bronchial/primary respiratory disease

Medications

B6

Please allow 24-48 hours for **B6** to process prescription refill requests.
Refill all medications indefinitely unless directed by **B6** or your primary care veterinarian.
• Please check all medications and dosages on your discharge report against the pharmacy labels.

Please Note

- Please see our website: **B6** for more information about **B6** dilated cardiomyopathy.

Nutrition Recommendations:

- Continue the Royal Canin Early Cardiac diet.
 - Consider fish oil supplements (omega-3 fatty acids). Her dose is approximately EPA 1220 mg and DHA 760 mg total per day. Please start at 1/2 the dose for one week, then increase to the full dose if tolerating well thereafter. Please avoid Cod liver oil and flax seed as well as products with Vit A and/or D.
- For more information about fish oils, please visit -- <http://vet.tufts.edu/heartsmart/diet/important-nutrients-for-pets-with-heart-disease/>
- In addition to the supplements approved by Tuft's Veterinary Nutrition Service, other reputable brands include Welactin and Nordic Naturals. [B6] may have additional brand recommendations.

Activity Recommendations:

- Continue normal activity as she wants and is able to do. Please allow [B6] to take more breaks and rest during activity.
- Please avoid exercise in the hot/humid weather.

At Home Monitoring:

- In order to monitor for the development of early congestive heart failure in the out-patient setting, we recommend monitoring your pet's resting respiratory rate several times a week. Normal resting respiratory rates should be less than 30 breaths per minute. Consider using a respiratory rate monitoring application to track [B6] respiratory rate - Cardalis or BI Pharma have reliable phone applications. Please contact us if you note a persistent or progressive increase.

Future Anesthesia/Fluid Recommendations

- We expect [B6] to tolerate carefully monitored general anesthesia with normal preoperative bloodwork and a balanced anesthetic regimen. During anesthesia, we recommend careful monitoring of ECG, BP and pulse ox and 1/2 usual surgical fluid rate (ie: 2-4 ml/kg/hr). Carefully monitor for several hours post-operatively for signs of respiratory congestion and consider chest radiographs if these signs occur. There is some risk associated with all anesthetic events.
- Avoid medications with tachycardia as a side effect, such as ketamine, telazol and glycopyrrolate. Cleared for low dose atropine if needed for intraprocedure bradycardia. Avoid medications that significantly alter blood pressure such as acepromazine and Domitor.
- [B6] should not receive corticosteroids (prednisone) in the future please contact [B6] for recommendations, if corticosteroids are indicated.

Reevaluation

- Recheck with [B6] in the next 2-4 weeks and every 6 months for wellness care as directed, close auscultation, blood pressure and complete lab tests including blood and urine testing (CBC/Chemistry/Urinalysis/Thyroid evaluation). Please forward these results when available.
- Please recheck with [B6] in 6 months for a follow up consultation/examination, blood pressure, and echocardiogram. Please contact us or schedule an earlier appointment if [B6] has any problems or symptoms indicative of worsening heart disease or if recommended by [B6]

We thank you for trusting in [B6] to care for [B6] today. Please do not hesitate to call us with any questions or concerns.

Sincerely,

B6

Visit Summary

Heart Rate: 130

BP: 155 mmHg

Cuff Size/Location: 6 cuff/LF

History: Recheck DCM, suspected early CHF; doing well; RRR - 16 bpm, increased [B6] in January due to increased cough; cough seems to be intermittent and related to excitement; good appetite; 3 kg weight gain since 10/2017; walks 30-45 minutes per day - slow pace, at times winded but recovers very quickly.

B6 developed a cough last Wednesday (10/25/17). Radiographs and blood work were performed by B6. B6 The lab work (which is unavailable for review) reportedly showed an elevated B6 and mild lymphopenia. Thoracic radiographs were performed which revealed cardiomegaly. B6 was treated with B6. All medications were stopped on Monday as her cough had worsened and she was presented to the B6 for a cardiac evaluation as her coughing had worsened and she had brought up a small volume of pink-tinged foam after a coughing fit. During this time there has been no evidence of lethargy and she continues to eat and drink normally at home.

PPHx: None
Meds: None
Other: UTD on vaccinations, On HW preventative
Diet: changed from Zignature (Kangaroo) to Royal Canin Early Cardiac

Physical Exam Findings: 3/6 pansystolic murmur, PMI - mitral valve, regular rhythm with S3 gallop; LUNGS - clear all fields, panting, normal effort; SI. overweight body condition (BCS - 6/9); Pink mm; PP - SS; PLN - WNL; ABD - hepatomegaly; BAR

Echocardiographic Findings

Mild left ventricular eccentric dilation - significant improvement compared to previous exam; mild, improved centrally located mitral regurgitant jet, normal, improved left atrial dimensions on 2D imaging and on M-mode imaging, mild, low velocity eccentric low velocity tricuspid regurgitation, subjectively normal right ventricular and right atrial dimensions, normal left and right ventricular outflow velocities, low normal, improved indices of systolic function (FS% and EF% by modified Simpson's, normal EPSS, normal transmitral inflow velocities and E:A wave ratio on spectral Doppler tracings, normal TDI E':A' ratio of the lateral mitral annulus, no masses, effusions or heartworms observed.

Comments

Dear B6

Thank you for sending B6 to see us with B6 today. I am quite pleased with B6 exam today. She has had remarkable improvement in her echocardiogram with the cardiac medications, change in diet and supplementation with Taurine and L-carnitine. Her risk for congestive heart failure at this point is very low so we will be weaning B6 off the B6 while B6 monitors B6 respiratory rate. Her current cough is likely due to respiratory disease and if the cough progresses/worsens, we will consider adding in a bronchodilator, such as B6. Right now, with the marked improvement, B6 long-term prognosis has improved considerably. I suspect we will be able to further discontinue cardiac medications if her heart remains stable. We will continue to closely monitor B6 heart disease via serial echocardiography and institute further therapy when progression is noted. While on this course of medication, it is important to monitor the chemistry profiles and blood pressures. Hopefully, B6 will continue to do so well - she's a sweetie!

We appreciate your continued referrals and the trust you place in B6 to co-manage your cardiac patients. We look forward to working with you on this case and others. In an effort to continue to improve B6 service to both you and your clients, please visit our website at B6 and complete our online referring veterinarian survey.

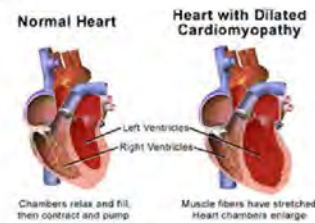
Sincerely,

B6



Dilated Cardiomyopathy Webinar

Dr. Martine Hartogensis





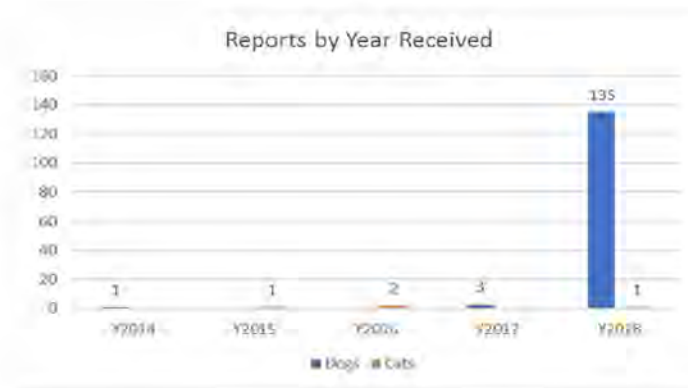
Report numbers

- Approximately 143 reports of Dilated Cardiomyopathy (DCM) have been received as of 8/23/2018
 - 139 reports for dogs (151 reacted, 36 died, 24% death rate)
 - 4 reports for cats (8 reacted, 1 died, 12.5% death rate)
- July 12, 2018 FDA CVM Update about potential connection between DCM and diet stimulated reporting (more than 110 DCM reports received in the 6 weeks after that)
- Case definition: report states that pet was diagnosed with dilated cardiomyopathy. (Many have provided medical records and echocardiography results)

Approximately 220 “cardiac” cases were received between 7/12/2018 and 8/22/2018, of which, ~110 were DCM so about half.



Reports by Year Received





Demographic data – age, weight and sex

	Mean	Range	N
Dogs			
Age (years)	6.8	1 – 16	134
Weight (lbs)	64.9	11 – 212	126
Sex	42% female		
Cats			
Age (years)	6.1	2 – 12	4
Weight (years)	10.3	7 – 12	3
Sex	50% female		

Cases are mostly older and male as is seen for genetic forms. However, our cases have a wider age and weight range than would be expected of most of the genetic DCM breeds, which tend to be large and giant breeds, with disease starting at middle to older age.



Most frequently reported dog breeds

Dog Breeds	Number of Reports
Golden Retriever	28
Mixed	19
Labrador Retriever	10
Great Dane	9
Doberman Pinscher	4
American Cocker Spaniel	3
Australian Shepherd	3
Boxer	3
French Bulldog	3
German Shepherd	3
Standard Poodle	3
Australian Cattle Dog	2

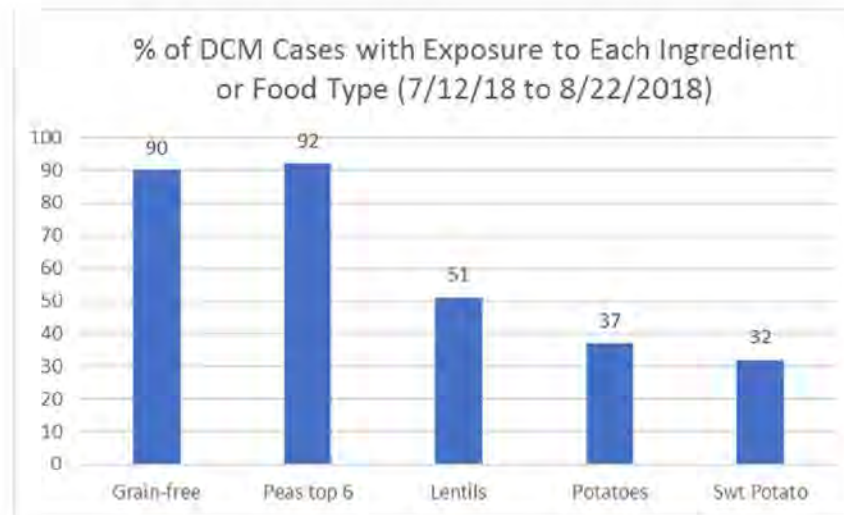
* Genetic breed per Fascetti, 2003: Scottish Deerhound, Doberman Pinscher, Irish Wolfhound, Great Dane, Boxer, Saint Bernard, Afghan Hound, Newfoundland, Old English Sheepdog. Some of the reported breeds have genetic forms of DCM, but they may still be susceptible to dietary influences. Some sources say Cocker Spaniels also have a genetic form, Golden Retrievers????

1 to 2 reports of DCM have been received for a wide variety of other breeds

- Many of those do not have recognized genetic forms of DCM



Shetland Sheepdog	2
Shih Tzu	2
Vizsla	2
Afghan Hound	1
Alaskan Malamute	1
Basset Hound	1
Belgian Shepherd - Groenendael	1
Berger Picard	1
Bluetick Coonhound	1
Bull Terrier	1
Chinese Crested - Hairless	1
French Spaniel	1
Gordon Setter	1
Greyhound	1
Irish Soft-Coated Wheaten Terrier	1
Irish Terrier	1
Lhasa Apso	1
Miniature Pinscher	1
Old English Sheepdog	1
Pit Bull	1
Pomeranian	1
Portuguese Water Dog	1
Pug	1
Retriever (unspecified)	1
Rottweiler	1
Schnauzer (unspecified)	1
Whippet	1
Yorkshire Terrier	1



Ingredients were identified for each of the reported foods in each of the cases reported to FDA CVM (per web searches). Exposure to each of the following categories was determined on a case basis. Approximately 90% were eating grain-free diets (or labeled zero-grain). Approximately 10% ate grain-containing diets – see next slide. 92% of all cases were exposed to diets that list peas in the top 6 ingredients. Some of the grain-containing diets listed peas high in the ingredient list. Previous analyses have shown that the protein source has been variable, while there are quite a few with kangaroo, cases have a wide variety of protein source exposure, including salmon, bison, lamb, turkey, and even beef and chicken.



Non-grain free food characteristics

- Of the approximately 10% of DCM cases that reported eating grain-containing foods (NON-grain-free)
 - 12 of 13 had rice/brown rice in the top ingredients, whereas no grain-free diets contained these (rice = a grain)
 - 8 of 13 listed peas in the top 6 ingredients
 - 7 of 13 listed potatoes in the ingredients

In the early 2000's, there was an outbreak of DCM in dogs eating lamb meal and rice diets



Brands reported most frequently

Brand	# reports
Zignature	19
Nature's Domain	14
Earthborn Holistic	12
Acana	10
California Natural	9
Taste of the Wild	8
4Health	7
Natural Balance	5
Fromm	5
Rachael Ray	3
Nature's Recipe	3
Merrick	3
Blue Buffalo	3
V-Dog	2
NutriSource	2
Halo	2





Echocardiographic phenotype of canine dilated cardiomyopathy differs based on diet type



Darcy Adin, DVM^{*}, Teresa C. DeFrancesco, DVM ,
Bruce Keene, DVM , Sandra Tou, DVM , Kathryn Meurs, DVM,
PhD , Clarke Atkins, DVM , Brent Aona, DVM , Kari Kurtz, DVM ,
Lara Barron, DVM , Korinn Saker, DVM, PhD

College of Veterinary Medicine, North Carolina State University, 1060 William Moore
Dr., Raleigh, NC, 27607, USA

Received 30 May 2018; received in revised form 24 October 2018; accepted 6 November 2018

KEYWORDS

Nutritional;
Heart failure;
Dog;
Taurine

Abstract *Introduction:* Canine dilated cardiomyopathy (DCM) can result from numerous etiologies including genetic mutations, infections, toxins, and nutritional imbalances. This study sought to characterize differences in echocardiographic findings between dogs with DCM fed grain-free (GF) diets and grain-based (GB) diets.

Animals: Forty-eight dogs with DCM and known diet history.

Methods: This was a retrospective analysis of dogs with DCM from January 1, 2015 to May 1, 2018 with a known diet history. Dogs were grouped by diet (GF and GB), and the GF group was further divided into dogs eating the most common grain-free diet (GF-1) and other grain-free diets (GF-o). Demographics, diet history, echocardiographic parameters, taurine concentrations, and vertebral heart scale were compared between GB, all GF, GF-1, and GF-o groups at diagnosis and recheck.

Results: Dogs eating GF-1 weighed less than GB and GF-o dogs, but age and sex were not different between groups. Left ventricular size in diastole and systole was greater, and sphericity index was less for GF-1 compared with GB dogs. Diastolic left ventricular size was greater for all GF compared with that of GB dogs. Fractional shortening, left atrial size, and vertebral heart scale were not different between groups. Taurine deficiency was not identified in GF dogs, and presence of congestive heart failure was not different between groups. Seven dogs that were

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^{*} Corresponding author.

E-mail address: adind@ufl.edu (D. Adin).

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Commentary

Diet-associated dilated cardiomyopathy in dogs: what do we know?

Lisa M. Freeman DVM, PhD

Joshua A. Stern DVM, PhD

Ryan Fries DVM

Darcy B. Adin DVM

John E. Rush DVM, MS

From the Department of Clinical Sciences, Cummings School of Veterinary Medicine, Tufts University, North Grafton, MA 01536 (Freeman, Rush); Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California-Davis, Davis, CA 95616 (Stern); Department of Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802 (Fries); and Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC 27607 (Adin).

Address correspondence to Dr. Freeman (lisa.freeman@tufts.edu).

Diet-associated DCM first came to light in cats in the late 1980s¹ and in dogs in the mid-1990s.² The association between diet and DCM in dogs has generally not been much in the news since the early 2000s, but over the past few years, an increasing number of DCM cases involving dogs appear to have been related to diet. The extent of this issue is not clear, not all cases have been confirmed to be linked to diet, and a true association has not been proven to exist. However, when one of the authors (RF) recently surveyed veterinary cardiologists about cases of possible diet-associated DCM in dogs examined in the past 2 years, information for > 240 cases was obtained, with responses received from the United States, United Kingdom, Canada, Israel, and Austria (unpublished data). Dogs for which breed was specified consisted of mixed-breed dogs (n = 134), Golden Retrievers (23), Labrador Retrievers (9), German Shepherd Dogs (8), Cocker Spaniels (7), and between 1 and 5 dogs each of 25 other breeds. Further, possible diet-associated DCM represented 16% of all cases of DCM diagnosed by the respondents during this period.

The recent announcement from the US FDA³ alerting pet owners and veterinarians about reports of DCM in dogs eating pet foods containing peas, lentils, other legume seeds, or potatoes as main ingredients has raised concerns among the pet-owning public. Therefore, we wanted to increase awareness of this issue among veterinarians, review what is currently known about the possible association between certain diets and DCM in dogs, and discuss what veterinarians can do to help identify underlying causes.

DCM and Diet in Dogs and Cats

Dilated cardiomyopathy used to be one of the most common cardiac diseases in cats. In 1987, how-

ABBREVIATIONS

BEG	Boutique, exotic-ingredient, and grain-free
CHF	Congestive heart failure
DCM	Dilated cardiomyopathy

ever, Pion et al¹ published a landmark paper reporting that DCM in cats was associated with taurine deficiency and could be reversed by providing supplemental taurine. On the basis of that report and substantial subsequent research, the requirement for taurine in cat foods was increased, and taurine deficiency-related DCM is now uncommon in cats. However, it can still be seen in cats eating home-prepared diets or commercial diets prepared with inadequate nutritional expertise or quality control.

In 1995, veterinary cardiologists investigating the role of taurine deficiency in dogs with DCM suggested that certain breeds (eg, Golden Retrievers and American Cocker Spaniels) may be predisposed to taurine deficiency,² and a study in Cocker Spaniels subsequently showed that supplementation with taurine and L-carnitine could partially or completely reverse the disease.³ Additional dog breeds potentially predisposed to taurine deficiency-associated DCM were identified, including Newfoundlands, English Setters, Saint Bernards, and Irish Wolfhounds.⁵⁻¹⁰ Later, certain types of diets, including lamb and rice, low-protein, and high-fiber diets were associated with taurine deficiency in some dogs.^{5,7,9,11-14} Research suggested that other ingredients (eg, beet pulp) may also increase the risk of taurine deficiency,⁵ although the exact role of these ingredients was still unclear. In addition, the apparent breed predispositions suggested that genetic factors, breed-specific metabolic abnormalities, or low metabolic rates may also have been playing a role.^{8,9,16}

Current Concerns About Diet and DCM in Dogs

Beginning in the early 2000s, the number of dogs with taurine deficiency and DCM subjectively appeared to decrease. Recently, however, we have heard from veterinary cardiologists who had an impression that they were diagnosing DCM in Golden Retrievers at higher rates than expected and in dogs of breeds

typically not thought to be prone to this condition. Subjectively, it also appeared that these dogs were frequently eating BEG diets containing foodstuffs such as kangaroo, duck, buffalo, salmon, lamb, bison, venison, lentils, peas, fava beans, tapioca, barley, or chickpeas as major ingredients. Some of the affected dogs had low plasma or whole blood taurine concentrations and improved with taurine supplementation and a diet change. On the other hand, some dogs that did not have low plasma or whole blood taurine concentrations also improved with a diet change and taurine supplementation. Cardiologists and other veterinarians have been reporting cases to the US FDA, which is investigating the issue.³

Currently, it seems that in addition to those dogs with DCM completely unrelated to diet (eg, breed-specific DCM), there may be 2 groups of dogs with diet-associated DCM: dogs with DCM specifically related to taurine deficiency and dogs with DCM associated with separate, but yet unknown, dietary factors. Identifying the potential dietary factors contributing to DCM in these latter 2 groups may be challenging. From our discussions with veterinary cardiologists, it appears that many dogs in both groups have been eating BEG diets; however, the true percentages are not known. The previously mentioned survey identified 23 types of BEG diets being fed to dogs with DCM, including home-prepared diets, and not all diets were grain-free diets. Importantly, BEG diets have increased in popularity in recent years, and many dogs with DCM unrelated to diet and many dogs without DCM are likely eating these diets.

Multiple factors play a role in the increased popularity of BEG diets.¹⁷ Regardless, the apparent link between BEG diets and DCM may be due to the grain-free nature of these diets (ie, use of ingredients such as lentils, chickpeas, or potatoes to replace grains), other common ingredients in BEG diets (eg, exotic meats, flaxseed, fruits, or probiotics), possible nutritional imbalances, or inadvertent inclusion of toxic dietary components. Or, the apparent association may be spurious.

The complexity of pet food manufacturing is often underestimated. Pet foods must contain all required nutrients in the right amounts and right proportions. Nutrient standards (minimums and, for some nutrients, maximums) are established by the Association of American Feed Control Officials. However, the effects of processing (or not processing) the ingredients must also be considered, along with nutrient bioavailability and the effects of all other ingredients in the food. Unfortunately, this may not always be done. In addition, extensive testing is needed on an ongoing basis to ensure rigorous quality control. Inclusion of exotic ingredients, such as kangaroo, alligator, fava beans, and lentils, adds another level of complexity to ensuring the diet is nutritious and healthy. Exotic ingredients have different nutritional profiles and different digestibility than typical ingredients and have the potential to affect the metabolism of other nutrients. For example, the bioavailability of taurine is different when included in a lamb-based

diet, compared with a chicken-based diet, and can be affected by the amount and types of fiber in the diet.^{14,15}

Diet-associated DCM in dogs with taurine deficiency

Golden Retrievers have been reported, as a breed, to be susceptible to development of taurine deficiency-associated DCM,^{2,8} leading some to suggest a breed-wide genetic propensity for diet-associated DCM. One of the authors (JAS) recently concluded a study evaluating 24 Golden Retrievers with echocardiographically confirmed DCM and low plasma or whole blood taurine concentrations that were followed up for 12 to 24 months after a diet change and the addition of supplemental taurine to their diet (unpublished data). Although the results are still preliminary, all but 1 dog for which follow-up data were available had substantial echocardiographic improvement. In addition, in all 9 dogs that initially had CHF, the heart failure resolved, and diuretic administration was substantially reduced or safely discontinued. All 24 of these Golden Retrievers were eating BEG diets at the time DCM was diagnosed.

Although taurine deficiency appears to be more common in Golden Retrievers than in dogs of other breeds, plasma and whole blood taurine concentrations should be measured in every dog with DCM because some dogs of other breeds with DCM have been found to have taurine deficiency. Even dogs of breeds that have previously been found to be genetically predisposed to developing DCM, such as Doberman Pinschers and Boxers, should be tested because taurine concentrations have been found to be low in some of these dogs also. In addition, taurine deficiency should be considered as a possibility not just in dogs eating BEG, very-low-protein, or high-fiber diets, but also in dogs eating vegetarian, vegan, or home-prepared diets.

The reasons for taurine deficiency in dogs are not completely understood but could be related to reduced synthesis of taurine resulting from an absolute dietary deficiency of the taurine precursors methionine and cystine; reduced bioavailability of taurine, methionine, or cystine in the diet; abnormal enterohepatic recycling of bile acids because of fiber content of the diet; increased urinary loss of taurine; or altered metabolism of taurine in the intestine as a result of interactions between certain dietary components and intestinal microbes.^{9,12-16} In addition to the possibility of breed-related metabolic differences, there may be genetic factors that play a role in susceptibility to taurine deficiency, as appeared to be the case in cats with taurine deficiency.¹⁸

Diet-associated DCM in dogs without taurine deficiency

Preliminary results of a study⁴ performed by one of the authors (DBA) found that dogs with DCM that had been eating grain-free diets had more advanced cardiomyopathic changes than did dogs with DCM that had been eating grain-based diets. Unreported results of the study indicated that a subset of dogs

clinically and echocardiographically improved after a diet change. Notably, however, some dogs improved after a diet change from one grain-free diet to another, and this finding, along with the differences identified between dogs fed various BEG diets, suggested that DCM was not necessarily tied to the grain-free status of the diet. Taurine supplementation was prescribed for many of these dogs despite the lack of apparent deficiency, and it is unclear what role taurine may have played in their recovery.

Although DCM in some dogs without any apparent taurine deficiency appears to be reversible with a change in diet, with or without taurine supplementation, no cause has thus far been identified for non-aurine deficiency-associated DCM. Possible causes that are being investigated include absolute deficiencies of other nutrients, altered bioavailability of certain nutrients because of nutrient-nutrient interactions, and the inadvertent inclusion of toxic ingredients.

For example, BEG diets could possibly be more likely to have deficiencies of nutrients other than taurine, such as choline, copper, L-carnitine, magnesium, thiamine, or vitamin E and selenium, that have been associated with cardiomyopathies.¹⁹ Although pet foods are required to be nutritionally complete and balanced (unless they have a label statement that they are for intermittent or supplemental use only), that does not always provide a guarantee,²⁰ and deficiencies could occur if diets do not contain appropriate amounts of all dietary nutrients. Further, a deficiency may occur even if a diet contains the required minimum amount of a nutrient because of reduced bioavailability or interaction with other ingredients in the diet. This may be a concern for diets based on exotic ingredients, whose nutritional properties may not be as well studied.

Researchers are also exploring whether diet-associated DCM in dogs without taurine deficiency may be related to inclusion of a cardiotoxic ingredient in the diet. This could be an adulterated ingredient, as with ingredients containing melamine-cyanuric acid that affected pet foods in 2007, resulting in extensive recalls²¹; a heavy metal; a chemical sprayed on 1 of the ingredients; or even a natural chemical compound in 1 of the ingredients that has toxic effects when fed in large amounts.

Of course, the cause may be even more complicated, such as an interaction between gut microbiota and a dietary factor (eg, trimethylamine *N*-oxide).²² It is encouraging that some recovery of cardiac function has been observed in some dogs following a change in diet, with or without taurine supplementation. However, research is needed to identify the underlying cause.

Diet History

For many years, veterinary nutritionists have emphasized the importance of nutritional assessment.^{23,24} Nutritional assessment includes 4 key components: body weight, body condition score, muscle condition score, and diet history. Body weight and

body condition score are likely already a part of most clinicians' standard physical examination, and muscle condition scoring would be a valuable addition. Cardiac cachexia (muscle loss) occurs early in patients with CHF and should be detected at its mildest stages, when interventions are more likely to be successful.²⁵ Muscle condition scoring charts and training videos are available.^{26,27}

The fourth component of nutritional assessment—diet history—may not be routinely collected but is equally important. A diet history, for example, can help identify issues that could be contributing to an underlying disease. For patients with recent-onset CHF, for example, the diet history may reveal that the owner changed to a new diet with a higher sodium content. Other diet-associated issues that can be identified from the diet history include anemia or thiamine deficiency caused by a nutritionally unbalanced home-prepared diet or diarrhea due to a contaminated raw meat diet. Veterinary cardiologists examining dogs with DCM were able to make an association with BEG diets because they were obtaining a diet history, and obtaining a diet history may help researchers identify patterns (eg, products made by the same manufacturer or by manufacturers using ingredients from the same supplier) that could eventually lead to determining the underlying cause.

A diet history can also identify an individual patient's food preferences, such as whether canned or dry food is preferred or whether specific flavors are preferred, that can be helpful for feeding when the patient is hospitalized. And, a diet history is useful in determining whether the patient's usual diet is appropriate after discharge or needs to be changed. For example, dietary modification will be required for dogs with cardiac disease that are eating high-sodium dog food or treats.

The diet history should include the main foods being fed. However, this is more than just "dry dog food" or "brand X dog food." It is critical to solicit information on brand, the exact product, and even the flavor, as these factors can make a big difference in the ingredients and nutrient profile. We recommend telling owners that their description of a product should be detailed enough that we could go to the store and buy the exact product they are feeding. If owners are feeding a home-prepared diet, the exact recipe should be provided.

Of course, pet food is often just the tip of the iceberg. The diet history should also include all treats; table food; rawhides, bully sticks, and other chews; dietary supplements; and foods used to administer medications. These other components of the diet can contribute large amounts of sodium and other nutrients to a patient's overall intake or unbalance the overall diet. In addition, these other components may contribute to adverse effects. For example, a Fanconi-like syndrome associated with jerky treats has been reported²⁸ but may not have been identified if complete diet histories had not been obtained for affected dogs. In addition, although diet-associated DCM is most likely related to pet food, it may possibly be a result of another dietary

component (eg, treats, chews, or supplements) commonly fed to dogs eating these diets.

Use of a standard form, such as the generic form recommended by the World Small Animal Veterinary Association,²⁶ or a cardiology-specific form (**Supplementary Appendix S1**, available at avmajournals.avma.org/doi/suppl/10.2460/javma.253.11.1390) will facilitate obtaining a complete diet history. We recommend all clinicians collect a diet history for every dog and cat patient at every appointment. Because many owners are unable to recall specific diet details at the time of their appointment, we recommend having owners complete the diet history form at home prior to the appointment so that they can provide exact details on all components of the diet.

Recommendations

If DCM is diagnosed in a dog that is eating a BEG, vegetarian, vegan, or home-prepared diet, we recommend measuring plasma and whole blood taurine concentrations.⁹ It is still unclear whether plasma or whole blood taurine concentration more accurately reflects myocardial concentration in dogs, so measurement of both plasma and whole blood taurine concentrations is recommended. However, if cost is an issue, measurement of whole blood taurine concentration should be prioritized because it is thought to be a better indicator of long-term taurine status. Importantly, reference ranges for taurine concentrations in dogs should be interpreted cautiously. Dilated cardiomyopathy has been diagnosed in some dogs, particularly Golden Retrievers, with whole blood taurine concentrations between 200 and 250 nmol/L, which would generally be considered within reference limits, although at the low end of the reference range. At least some of these patients, however, have responded well to a diet change and taurine supplementation. Therefore, reference ranges for plasma and whole blood taurine concentrations may need to be breed specific. Research in Golden Retrievers with taurine deficiency-associated DCM is ongoing, but a whole blood taurine concentration of at least 250 nmol/L is recommended for this breed.

We also recommend that all other dogs in the household that are eating the same diet be screened for DCM. Further, we recommend that owners of dogs with possible diet-associated DCM be instructed to save samples of all dietary components they are currently feeding, including not only the main food itself but also all treats, chews, and supplements. Ideally, this would include not just samples of the dietary components but also product bags or labels. With complete diet information in hand, the veterinarian or owner should report the case to the FDA, which can be done either online or by telephone²⁹ because this will help the agency identify possible underlying causes as quickly as possible. A recently published article³⁰ provides an excellent summary of information for veterinarians on reporting suspected animal food issues. If the dog is a Golden Retriever, the veterinarian or owner may also consider reporting the case to the Josh Stern Cardiac Genetics Laboratory,³¹ which

is currently evaluating possible genetic factors that may increase susceptibility to taurine deficiency.

For dogs in which possible diet-associated DCM is diagnosed, we recommend the owner change the diet to one made by a well-established manufacturer that contains standard ingredients (eg, chicken, beef, rice, corn, and wheat). In the authors' (LMF and JER) hospital, we recommend several specific products with a low sodium content that only contain standard ingredients.³² We also emphasize that changing to a raw or home-prepared diet may not be sufficient to improve cardiac abnormalities and may increase the risk for other nutritional deficiencies or infectious diseases. For dogs that require a home-prepared diet or that have other medical conditions that require special dietary considerations, consultation with a board-certified veterinary nutritionist is recommended.

We also provide supplemental taurine for all dogs with possible diet-associated DCM. In dogs with a taurine deficiency, taurine supplementation is critical. In dogs with taurine concentrations within reference limits, it is unclear whether taurine supplementation is needed, and some patients have recovered with only a diet change. However, taurine supplementation may still have some benefits owing to other effects of taurine (eg, antioxidant and positive inotropic effects). Taurine supplements from manufacturers with a history of good quality control should be used. A 2009 study³³ identified certain brands with good quality control. In addition, ConsumerLab is expected to release a report in late 2018 on independent quality control testing of taurine supplements.

Although the optimal taurine dosage for dogs with taurine deficiency is not fully understood, we recommended 250 mg, PO, every 12 hours for dogs weighing < 10 kg (22 lb); 500 mg, PO, every 12 hours for dogs weighing 10 to 25 kg (55 lb); and 1,000 mg, PO, every 12 hours for dogs weighing > 25 kg.

Follow-up echocardiography should be performed in 3 to 6 months. In our experience, some improvements are typically evident in this time span. However, in certain dogs, it may take even longer for improvements to be apparent echocardiographically.

Finally, although an association between BEG diets and DCM in cats has not been recognized, we recommend collecting diet histories on all cats as well and especially in cats with DCM. If cats with DCM are eating a BEG, vegetarian, vegan, or home-prepared diet, we recommend following the same protocol as described for dogs.

Summary

Pet food marketing has outpaced the science, and owners are not always making healthy, science-based decisions even though they want to do the best for their pets. The recent cases of possible diet-associated DCM are obviously concerning and warrant vigilance within the veterinary and research communities. Importantly, although there appears to be an association between DCM and feeding BEG, vegetarian, vegan, or home-prepared diets in dogs, a cause-and-effect rela-

relationship has not been proven, and other factors may be equally or more important. Assessing diet history in all patients can help to identify diet-related cardiac diseases as early as possible and can help identify the cause and, potentially, best treatment for diet-associated DCM in dogs.

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Footnotes

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Nutrition and Cardiomyopathy: Lessons from Spontaneous Animal Models

*Lisa M. Freeman, DVM, PhD, DACVN, and
John E. Rush, DVM, MS, DACVIM (Cardiology), DACVECC*

Corresponding author

Lisa M. Freeman, DVM, PhD, DACVN
Department of Clinical Sciences, Cummings School of Veterinary
Medicine, Tufts University, 200 Westboro Road, North Grafton,
MA 01536, USA.
E-mail: Lisa.Freeman@Tufts.edu

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Spontaneously occurring dilated cardiomyopathy in dogs and hypertrophic cardiomyopathy in cats are common diseases and are vastly underutilized as models of human cardiac disease. The goals of nutrition are no longer limited to a low-sodium diet, as research is now showing that nutrients can modulate disease and be an important adjunct to medical therapy. Deficiencies of certain nutrients can contribute to cardiomyopathies, as with taurine, but some nutrients—such as n-3 fatty acids, carnitine, and antioxidants—may have specific pharmacologic benefits. Dogs and cats with spontaneous cardiomyopathies are an exciting and promising model for studying nutritional modulation of cardiac disease.

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