


**TRUTHS AND MYTHS ABOUT
MANAGING THE DIABETIC CAT WITH
PANCREATITIS**

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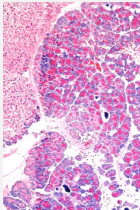
FELINE PANCREATITIS

- Highly prevalent, specially older cats (67%)
- Sometimes asymptomatic
- Variable clinical signs
- Difficult diagnosis
 - Low specificity and sensitivity of tests
 - “Specialist” testing required
 - Diagnosis of exclusion

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FELINE PANCREATITIS

- **Acute pancreatitis**
 - Acute necrotizing pancreatitis (ANP)/neutrophilic pancreatitis
 - Similar to acute pancreatitis in dogs
 - High morbidity and mortality
 - Less common in cats
 - Easier to diagnose



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FELINE PANCREATITIS

Chronic pancreatitis (45-67% cats)

- Lymphocytic inflammation, fibrosis, and acinar atrophy
- More insidious/recurring clinical signs
- Can have acute crisis
- Can result in exocrine pancreatic insufficiency
- More difficult to diagnose/manage

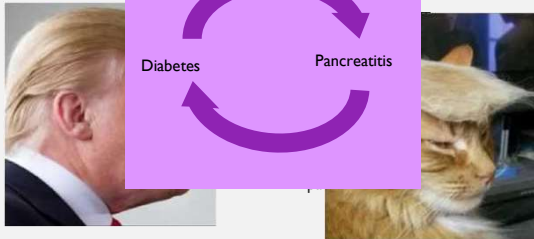
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FELINE CHRONIC PANCREATITIS

- Predominant type of pancreatitis in diabetic cats
- Can also be present as part of "triaditis" (IBD, pancreatitis, cholangitis)
- Insidious non-specific clinical signs
 - Anorexia/reduced appetite
 - Lethargy
 - Weight loss
 - Diarrhoea
 - Poor coat
 - Abdominal pain (post-prandial pain)

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PANCREATITIS-DIABETES COMBINATION



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Momo has pancreatitis



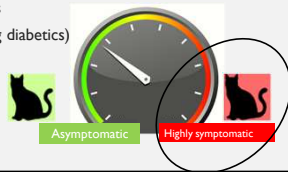
“Momo”: 12yo MN DSH

- Newly diagnosed diabetic
- Baseline testing for co-morbidities
- All WNL (CBC, Biochem, UA)
- fPLI: 10 µg/l (<5.4)

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TRUTH #1: PANCREATITIS IS COMMON IN DIABETIC CATS

- Acute pancreatitis in lower proportion of diabetics
- Chronic pancreatitis can affect 12-80% of diabetics
- Great variability due to different methods
- Tends to develop with time (long standing diabetics)
- Spectrum of clinical signs




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MYTH #1: MOMO'S PROGNOSIS IS WORSE THAN OTHER DIABETICS

- Biochemical pancreatitis ≠ clinical pancreatitis
- fPLI poor sensitivity/specificity in chronic pancreatitis
- Some diabetics will have “non-clinical” pancreatitis
- Diabetic pancreatitis cats can still achieve remission
- HOWEVER.....
 - Higher fPLI correlates weakly with higher fructosamine (more difficult to control?)
 - Remission rate lower with higher fPLI (is this really a problem?)



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• Is it worth-it running an fPLI on all newly diagnosed diabetics?

Probably NOT!

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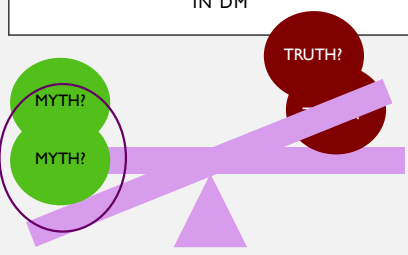
MYTH # 2: PANCREATITIS CAUSES INSULIN RESISTANCE IN DM



- Louie: 10 yo MN DMH
- Poorly controlled DM
- Insulin resistant ($> 2\text{iu/Kg}$)
- CBC/biochemistry WNL
- Abdominal US: Pancreatic enlargement
- fPLI: $8.6 \mu\text{g/l}$ (< 5.4)

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PANCREATITIS CAUSES INSULIN RESISTANCE IN DM



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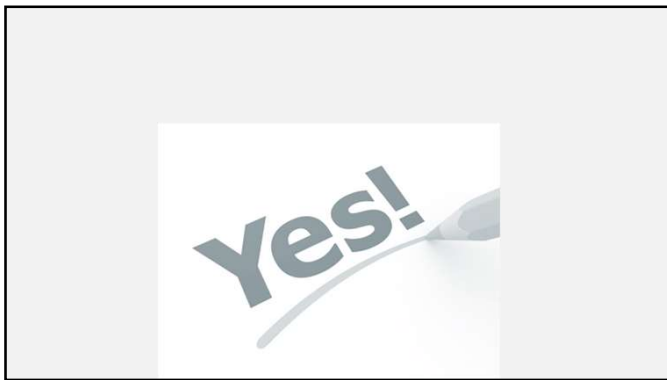
**DIABETES AND CHRONIC PANCREATITIS
IN HUMANS**

- Diabetes secondary to pancreatitis is considered Type 3c DM
- Malabsorption
- Maldigestion
- Lack of incretin effect
- Abnormal eating habits due to pain/nausea
- Lack of counter-regulatory pancreatic hormones (e.g. glucagon)

Higher risk of
hyperglycaemia

Diabetes + chronic pancreatitis = Brittle diabetics

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INSULIN RESISTANCE IN PANCREATITIS?

ACUTE PANCREATITIS	CHRONIC PANCREATITIS
<ul style="list-style-type: none"> • Systemic inflammation • Systemic release of inflammatory mediators • Systemic consequences • Insulin resistance? • LESS COMMON IN DIABETIC CATS 	<ul style="list-style-type: none"> • No clinical insulin resistance • Local inflammation/fibrosis • Lack of evidence of systemic inflammation • Local consequences • Insulin resistance???? • MOST COMMON IN DIABETIC CATS

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INSULIN RESISTANCE IN PANCREATITIS

- Cats: most commonly Type 2 DM
 - Chronic pancreatitis is a common co-morbidity
 - Unlikely advanced enough to cause brittle diabetes in ALL cats
 - But:Progresses with time: pancreatic fibrosis, damage to exocrine/endocrine pancreas → Can become brittle
- Type 3c DM is uncommon Or.... Is it?


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WHEN SHOULD I SUSPECT PANCREATITIS IS CAUSING PROBLEMS?

- **Patients with insulin resistance?** PROBABLY NOT!
 - May have elevated fPLI, but is this really the problem in these cats?
 - Exception: Multiple organ involvement (triaditis, IBD, others)?
- **Patients with.....**
 - Lethargy
 - Weight loss
 - Poor appetite


Hypoglycaemia

YES!



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ACROMEGALY CAUSES INSULIN RESISTANCE IN DM



- **Louie: 10.yo MN DMH**
- Poorly controlled DM
- Insulin resistant (> 2iu/Kg)
- CBC/biochemistry WNL
- Abdominal US: Pancreatic enlargement
- fPLI: 8.6 µg/l (<5.4)
- IGF-1: 1550 ng/ml (<1000)

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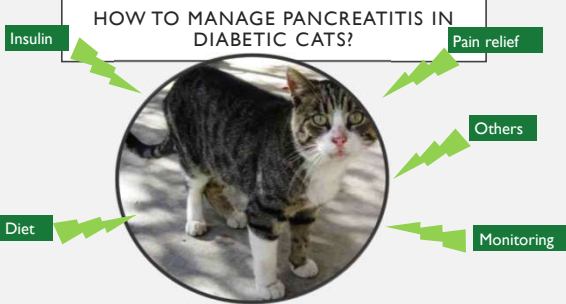
FELIX HAS CLINICALLY RELEVANT PANCREATITIS



- **Felix: 13 yo MN DSH**
- Diabetic since 9yo
- Weight loss
- Poor appetite
- Lethargic
- CBC/biochemistry WNL
- Abdominal US: Pancreatitis
- fPLI: 12.6 µg/l (<5.4)

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HOW TO MANAGE PANCREATITIS IN DIABETIC CATS?



- Insulin
- Pain relief
- Others
- Monitoring
- Diet

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MYTH #3: DIABETIC-PANCREATITIS CATS NEED HIGHER INSULIN DOSES

- CATS WITH PANCREATITIS RARELY HAVE INSULIN RESISTANCE
- Appetite can be variable in these cases
- Conservative with increases
- Home blood glucose monitoring can be helpful: tailored protocol
 - Alpha-track
 - Freestyle-Libre



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FELIX: INSULIN DOSAGE: 4IU SQ BID



- If "hypos" are a problem
 - Pre-insulin BG >20: 4iu
 - Pre-insulin BG 15-20: 2iu
 - Pre-insulin BG 10-15: 1 iu
 - Pre-insulin BG <10: No insulin
- If appetite is a problem (or no HBGM)
 - No food: 1iu
 - Some food: 2 iu
 - Full meal: 4 iu

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Very Fake News

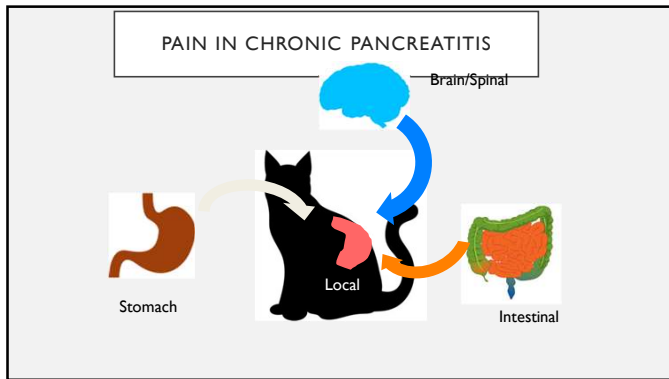
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DIETARY MANAGEMENT IN DIABETIC-PANCREATITIS CATS

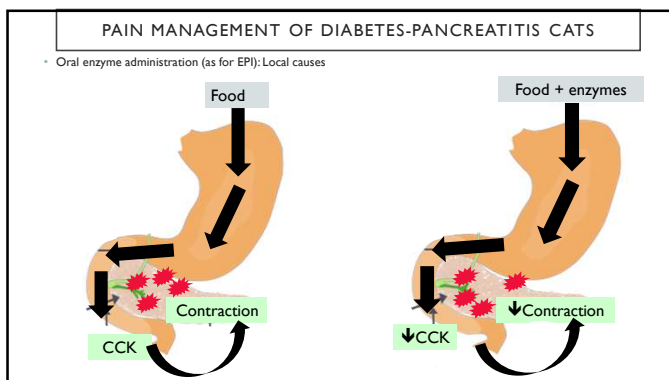
- If appetite is poor:
 - Feed whatever the cat would eat!
 - Consider post-prandial pain
 - Important factor in humans with CP
 - Multi-factorial in origin



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PAIN MANAGEMENT: PANCREATIC ENZYMES

- Used frequently in humans with CP to ease pain
- Some patients respond
- Less effective in others
- May also help with maldigestion/malabsorption
- Non-enteric coated
- Same dose as for EPI

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PAIN MANAGEMENT: ADITONAL OPTIONS

- **Antacids (gastric causes)**
 - Omeprazole: 1 mg/Kg/24h
 - Famotidine: 0.5 mg/Kg q 12-24h
- **Opioids (local and neural causes)**
 - Buprenorphine: 0.015 mg/Kg SL q 8h
 - Others: Gabapentin?



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ADDITIONAL MANAGEMENT OF DIABETES-PANCREATITIS CATS

- **Appetite stimulants**
 - Mirtazapine: 1.88mg PO q 24-48h
- **Antiemetics**
 - Mirtazapine
 - Maropitant (1mg/Kg PO q24h, 7d)
- **Additional supplements**
 - Cobalamin
 - Needed in cases of EPI
 - Also when concurrent IBD/triaditis
 - Fat soluble vitamins (if EPI)



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MONITORING OF DIABETIC-PANCREATITIS CATS

- HbGM provides important insight in glucose trends
- Freestyle libre™ (Abbott) does not require calibration and can collect up to 2 weeks of information
- Evaluation of clinical signs is important



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THE DIABETIC CLINICAL SCORE	
Factor	Score
Unintended Weight Loss 0 = None, or gained since last examined 1 = Mild (<5% loss) 2 = Moderate (5-10% loss) 3 = Severe (>10% loss)	2
Polyuria and Polydipsia 0 = Normal 1 = Mild (Some increase noted by owner) 2 = Moderate (Increased filling of water bowl) 3 = Severe (constantly at bowl)	1
Appetite 0 = Normal or decreased appetite 1 = Mild polyphagia (finishes eagerly) 2 = Moderate polyphagia (finished eagerly and begs for more) 3 = Severe polyphagia (obsessed with food)	1
Attitude/activity 0 = Normal 1 = Mild decrease (a bit less running and jumping) 2 = Moderate decrease (a lot less running and jumping) 3 = Severe decrease (lying about all the time)	2
Total Score =	6

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MANAGEMENT OF DIABETIC CATS WITH PANCREATITIS




- Both chronic conditions
- Pancreatitis can interfere with diabetes
- Symptoms are managed
- Home monitoring is very helpful
- Disease will progress:
- Treatment is symptomatic

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PROGNOSIS

- Pancreatitis can complicate management of DM
- Remission rates may be lower
- Many cats are not adequately managed
- Prognosis is fair
- Important to identify co-morbidities (triaditis)



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CONCLUSIONS

- Chronic pancreatitis is common in diabetic cats
 - The clinical significance will vary with each individual cat
 - The clinical consequences of this worsen over time
- Evaluation of fPLI is probably of little use in clinically normal cats
- INSULIN RESISTANCE IS RARELY LINKED TO PANCREATITIS IN DM
- HYPOGLYCAEMIA IS A REASON TO LOOK FOR PANCREATITIS

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THANK YOU!



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