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# Long term enteral nutrition in a kitten - a case report

**Diana Brozić, PhD, DVM**

ECVCN resident, ECAN Equine and Companion Animal Nutrition  
Faculty of Veterinary Medicine, Ghent University

## Case: Jolie, F, European shorthair kitten, 4m, 1.1 kg

Complaint of coughing up phlegm,  
regurgitating and breathing with open  
mouth -> emergency admission

complaints started 2 wk ago

@ primary vet: 5 days hospitalization + atb  
(Sinulox) and an expectorant (Dg.  
Pneumonia)

Lab work (hematology and biochemistry): OK

Drinking, urinating, defecation: OK

Vaccinations, deworming: OK

Other animals: 1 female cat



# Nutritional anamnesis

- was fed: whiskas kitten wet diet, *ad libitum*
- weight loss: from 1.35 kg to 1.10 kg over past 7 days (loss of 20% of BW)

# Diagnosis

- focal dilatation of esophagus (congenital diverticulum or congenital or acquired focal stenosis)
- aspirational pneumonia



## Nutritional support

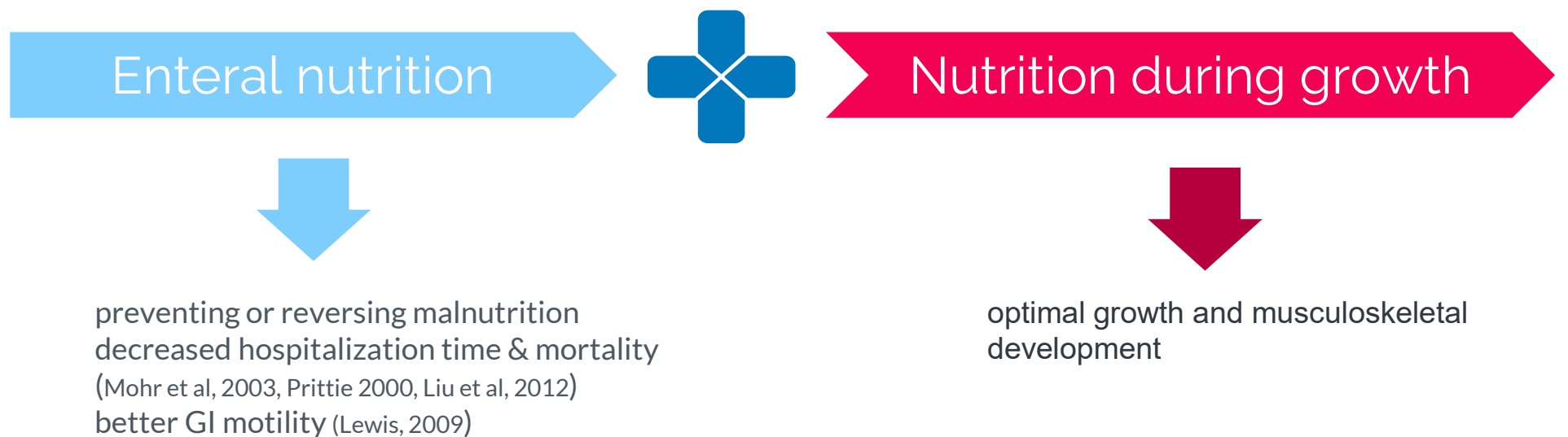
### Short term enteral nutrition (<7 days)

- Nasoenteral
- Nasogastric

### Long term enteral nutrition (> 7 days –several months)

- Esophageal
- Gastric

# Combining principles of enteral nutrition and growth



# 1st step: Energy requirements calculations (DER)

- <4 mo -> 2-2,5 x MER
- 4-9 mo -> 1,75-2 x MER  $\Rightarrow 2 \times 418 \times 1,35^{0,67} = 1022 \text{ kJ}$
- >9 mo -> 1,5 MER

RER in growing animals

24 hours after surgery  $\Rightarrow$

1022 \* 0,6 \* 1/3 -> 1st day  
 1022 \* 0,6 \* 2/3 -> 2nd day  
 1022 \* 0,6 -> 3rd day  
 1022 \* 1/3 -> 4th day  
 1022 \* 2/3 -> 5th day  
 1022 -> 6th day

Home care  $\Rightarrow$

DER  $\Rightarrow$

accurate predictive equation during growth in the ICU/at home -> challenge

(Sion-Sarid et al, 2013., Choen et al, 2013)



Individualized approach, close monitoring

## 2nd step: Diet

Enteral nutrition: gastric tube (nihil per os)

Gastric volume: 4 ml/100 g BW/meal

Frequency of feeding?



### Liquid polymeric diet

Indications: malnutrition, anorexia, post-surgery, lactation, growth, pregnancy

Composition: Milk proteins, soya oil, barley malt, minerals, egg yolk powder, vegetable fibres, Fructo-Oligo-Saccharides (FOS), marigold extract (source of lutein), lecithin, antioxidants, vitamins

ME = 1846 kJ/100 g DM -> 464,42 kJ/100 ml

Hospitalisation -> 7 meals/day

Home care -> 7 meals/day -> 6 meals/day

DER adapted weekly (aim to reach 10 grams daily growth) and based on age + GV

Balanceit programme

| Nutrients                          | Show All | % of Requirement | Amount (per kg DM)  | Requirement Range          |
|------------------------------------|----------|------------------|---------------------|----------------------------|
| [203] Protein                      |          | 145.8%           | 437.500 g           | (300 to [no max] g)        |
| [511] Arginine                     |          | 270.8%           | 29.792 g            | (11 to 35 g)               |
| [1000006] Taurine                  |          | 270.8%           | 6.771 g             | (2.5 to [no max] g)        |
| [204] Total lipid (fat)            |          | 277.8%           | 250.000 g           | (90 to [no max] g)         |
| [1000007] Biotin                   |          | 2361.1%          | 1.771 mg            | (0.075 to [no max] mg)     |
| [421] Choline, total               |          | 173.6%           | 4166.667 mg         | (2400 to [no max] mg)      |
| [406] Niacin                       |          | 302.7%           | 96.875 mg           | (32 to [no max] mg)        |
| [410] Pantothenic acid             |          | 895.5%           | 51.042 mg           | (5.7 to [no max] mg)       |
| [405] Riboflavin                   |          | 426.4%           | 13.646 mg           | (3.2 to [no max] mg)       |
| [404] Thiamin                      |          | 282.2%           | 15.521 mg           | (5.5 to [no max] mg)       |
| [418] Vitamin B-12                 |          | 868.1%           | 0.156 mg            | (0.018 to [no max] mg)     |
| [415] Vitamin B-6                  |          | 416.7%           | 10.417 mg           | (2.5 to [no max] mg)       |
| [323] Vitamin E (alpha-tocopherol) |          | 1918.9%          | 729.167 IU          | (38 to [no max] IU, Vit E) |
| [301] Calcium, Ca                  |          | 156.2%           | 15.625 g            | (10 to [no max] g)         |
| [1000000] Chloride                 |          | 217.0%           | 5.208 g             | (2.4 to [no max] g)        |
| [312] Copper, Cu                   |          | 229.2%           | 22.917 mg           | (10 to 28 mg)              |
| [303] Iron, Fe                     |          | 247.4%           | 197.917 mg          | (80 to 681.8 mg)           |
|                                    |          | 1%               | 12.500 g            | (8.4 to [no max] g)        |
|                                    |          | 5%               | 7.292 g             | (6 to [no max] g)          |
|                                    |          | 3%               | 4.167 g             | (1.6 to 18 g)              |
|                                    |          | 3%               | 148.958 mg          | (75 to 227 mg)             |
|                                    |          | 3%               | 25000.000 IU, Vit A | (9000 to 400000 IU, Vit A) |
|                                    |          | 2%               | 1890.625 IU, Vit D  | (180 to 2270 IU, Vit D)    |



FEDIAF 2019, cat growth



## Feeding advice adapted weekly

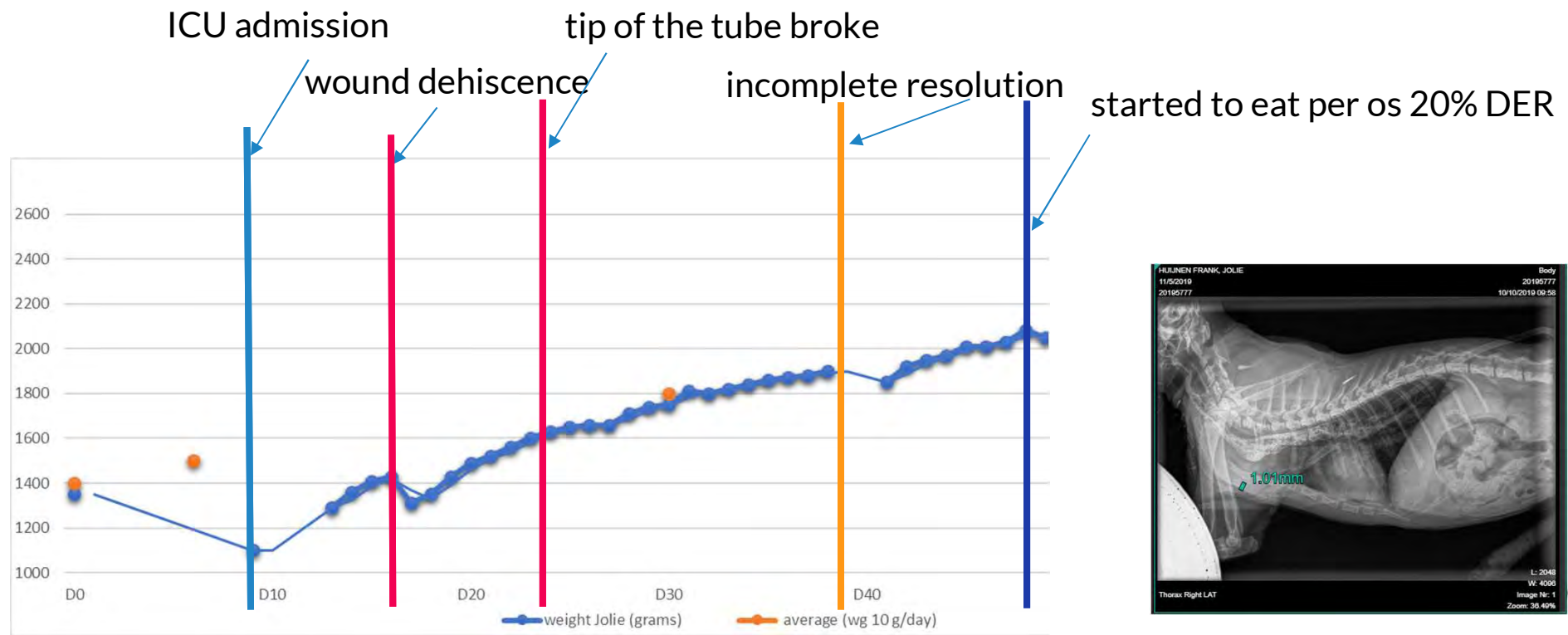


|                     | 9.9.2019                 |                      |      | 10.9.2019 |                      |            | 11.9.2019 |                      |                |            |      |                |
|---------------------|--------------------------|----------------------|------|-----------|----------------------|------------|-----------|----------------------|----------------|------------|------|----------------|
| Energy Requirement: | 1/3 DER                  |                      |      | 2/3 DER   |                      |            | 3/3 DER   |                      |                |            |      |                |
| Food 1:             | RC convalescence support |                      |      |           |                      |            |           |                      |                |            |      |                |
| ml/day              | 74                       |                      |      | 148       |                      |            | 224       |                      |                |            |      |                |
| ml/meal             | 10,5                     |                      |      | 21,1      |                      |            | 31,6      |                      |                |            |      |                |
| Time of meal:       | 9.9.2019                 |                      |      | 10.9.2019 |                      |            | 11.9.2019 |                      |                |            |      |                |
|                     | air                      | amount of food eaten |      | air       | amount of food eaten |            | air       | amount of food eaten |                |            |      |                |
|                     |                          | aspiration           | tube |           | flush 5ml +5ml       | aspiration |           | tube                 | flush 5ml +5ml | aspiration | tube | flush 5ml +5ml |
|                     |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| Weight at 9:00      |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 9:00                |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 12:00               |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 15:00               |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 18:00               |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 21:00               |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 0:00                |                          |                      |      |           |                      |            |           |                      |                |            |      |                |
| 6:00                |                          |                      |      |           |                      |            |           |                      |                |            |      |                |


FOR OWNER TO FILL IN

- For Jolie (1,1 kg) – 44 ml/meal → diet 31,6 ml+10 ml flush = 41,6 ml/meal

## 3rd step: Growth curve

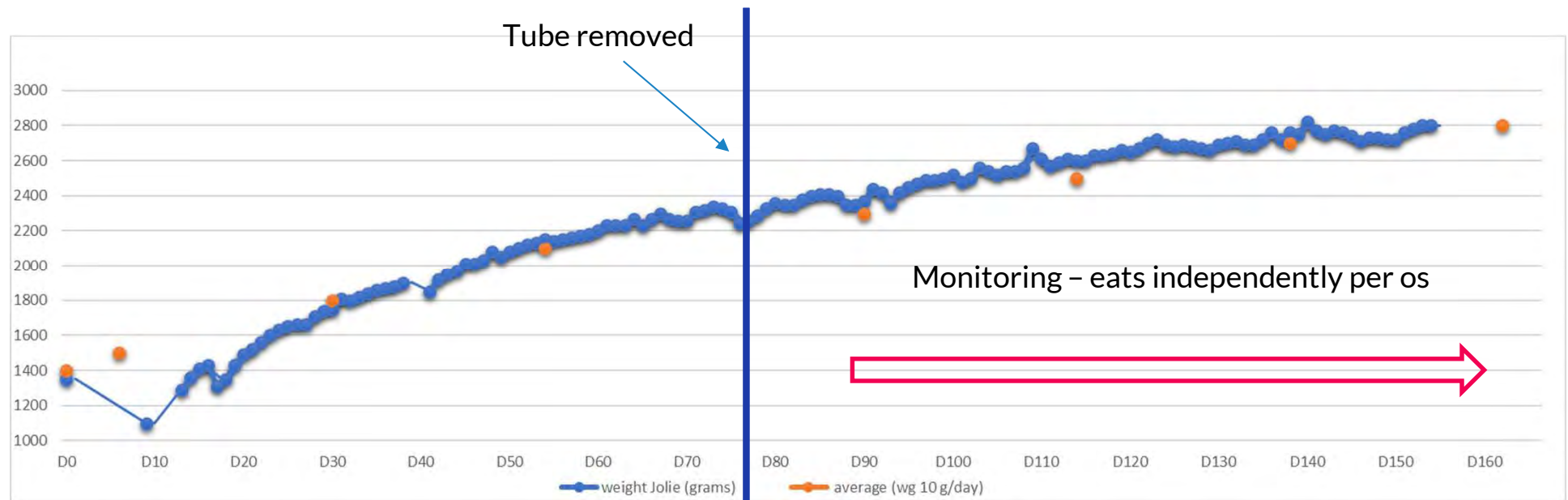


## 4th step: Diet per os + E

- 20% of DER per os + 80% of DER tube
  - Per os: RC kitten loaf diluted 1:1 (feeding in upright position)
  - Drinking independently p/o
  - Gradually increasing amount per os vs tube over 3 wk -> tube removed (tube disintegration (mushroom tip))
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- Full transition to per os feeding

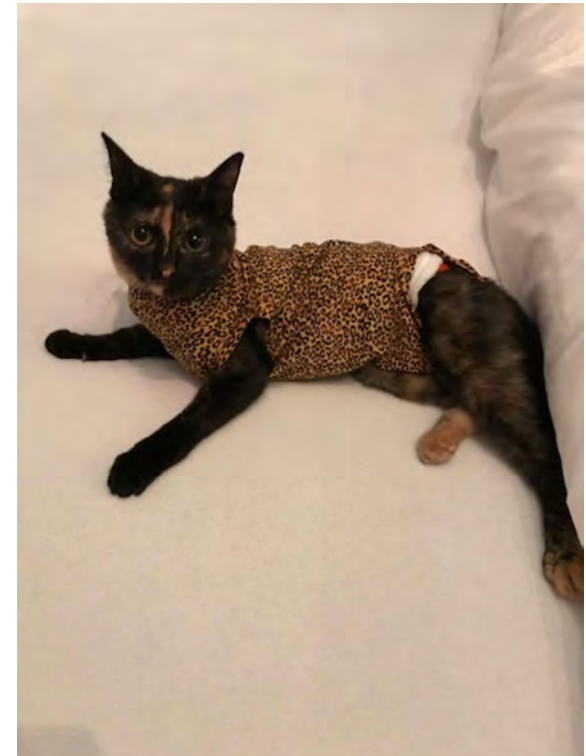


# Growth curve



# Complications & challenges

- Complications:
  - Would dehiscence
  - Broken tube tip
  - Clogged tube
  - Tube disintegration (mushroom tip)
- Challenges:
  - Gastric volume during growth/ volume of the food
  - Homecare – close monitoring and communication
  - Incomplete resolution of focal dilatation of esophagus



Thank you for  
attention!

**Any questions?**

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