

SECOND EDITION



# Differential Diagnosis in Small Animal Medicine



Alex Gough • Kate Murphy

WILEY Blackwell



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Second Edition

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**WILEY** Blackwell

This edition first published 2015 © 2015 by John Wiley & Sons, Ltd

*Registered Office*

John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK

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9600 Garsington Road, Oxford, OX4 2DQ, UK

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1606 Golden Aspen Drive, Suites 103 and 104, Ames, Iowa 50010, USA

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*Library of Congress Cataloging-in-Publication Data*

Gough, Alex, author.

Differential diagnosis in small animal medicine / by Alex Gough, Kate Murphy. – Second edition.  
pages ; cm

Includes bibliographical references and index.

ISBN 978-1-118-40968-8 (pbk.)

1. Dogs–Diseases–Diagnosis–Handbooks, manuals, etc. 2. Cats–Diseases–Diagnosis–Handbooks, manuals, etc.

3. Diagnosis, Differential–Handbooks, manuals, etc. I. Murphy, K. F. (Kate F.), author. II. Title.

[DNLM: 1. Animal Diseases–diagnosis–Handbooks. 2. Diagnosis, Differential–Handbooks.

3. Veterinary Medicine–methods–Handbooks. SF 748]

SF991.G672 2015

636.089'6075–dc23

2014034803

A catalogue record for this book is available from the British Library.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Cover image: dog and cat – iStockphoto © tetsuomori; all other images – reproduced with permission of the University of Bristol Photographic Unit

Set in 9/10.5pt Sabon by SPi Publisher Services, Pondicherry, India

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# Introduction

The first edition of this book was written by Alex Gough to fill a gap in the market. The aim was to provide a ready list of differential diagnoses to assist in the investigation of challenging medical cases, and the sales of the book would suggest this was a success.

This second edition has been co-authored by Alex Gough and Kate Murphy. Content has been reviewed and expanded where needed and some sections have been removed.

This book provides a ready reference for differential diagnoses for the majority of medical presentations that are encountered in general practice, including both common and uncommon conditions. This text should be of use to veterinary students, general practitioners, veterinary interns, residents and anyone who cannot fully carry these lists around in their heads. We hope clinicians find it useful.

The differential diagnosis list is one of the most important aspects of the problem-oriented approach to clinical diagnosis. For those who are not familiar with the problem-oriented approach, a brief outline follows.

As the name implies, problem-oriented medical management (POMM) concentrates on the individual problems of a patient. A differential diagnosis list should be made for each and every problem that is found in a patient, whether in the history, the physical examination, imaging or clinicopathological tests. Although superficially this may not sound very ‘holistic’, in fact, if all the patient’s problems are considered individually, the whole patient will have been evaluated, without falling into the trap of presuming that all of the findings are caused by a single condition. Some problems are of course less specific and less emphasis is given to the problem solving on those signs, e.g. lethargy and inappetence in a vomiting, jaundiced pet.

The problem-oriented approach starts with a thorough history, and it is important to discover what the owners perceive to be the main problems – after all, they usually know their animal better than the clinician does. However, there may be relevant historical signs that the owners had not considered significant, so failing to systematically ask all the questions which could be of importance in a case can lead to overlooking important information.

In every case, a complete physical examination should be carried out, including body systems that are not apparently of immediate concern.

Once the history has been taken and the physical examination has been completed, the clinician should list every problem (ideally rank the problems) that has been discovered. Problems may include such findings as exercise intolerance, pruritus, pyrexia or a heart murmur. A differential diagnosis list should then be created for every problem. The list should be appropriate to that animal. There is no point listing feline leukaemia virus as a likely diagnosis in a dog!

An attempt should also be made to categorise the conditions in order of likelihood, or at least into common and uncommon. Although the more common conditions have been indicated in this book with an asterisk (\*), there are few objective data regarding the true incidence of conditions, and the estimate of incidence is largely subjective and influenced by the authors' geographical location and caseload. Familiarity with how common conditions are and their local incidence will help prioritise differential lists. The clinician can then select diagnostic tests in a rough order of probability, although rarer but life-threatening conditions, such as hypoadrenocorticism, should also be ruled out early in the course of investigations. Some authorities rightly point out that emphasis should be placed on historical and physical signs and that 'over-investigating' can be expensive and potentially detrimental to the patient.

However, it is possible to place too much importance on probabilities and how commonly a condition occurs. The newly qualified veterinary surgeon will often look for the rare but exciting and memorable condition they learned about at college, while the experienced practitioner will often remind them that 'common things are common' and suggest they restrict their investigations only to commonly encountered conditions. The ideal approach is probably somewhere in between. The problem-oriented approach means that all differentials should have been considered and investigations can be targeted, but if a diagnosis is not made, the list should be revisited to consider other appropriate testing.

Some authorities prefer to categorise the initial approach to a case differently and describe the subjective and objective assessment of a patient as

part of the SOAP approach (Subjective, Objective, Assessment, Plan). The principle is the same however, in that a detailed history or physical examination is the basis of the initial differential list.

Once the differential diagnosis list has been formulated, the clinician is in a position to select appropriate tests to aid in making a definitive diagnosis. Prioritising the selection of diagnostic tests helps avoid placing undue financial strain on the client and inappropriate or unnecessary testing on the patient. Tests may be prioritised on such factors as the number of conditions which will be ruled in and out, the sensitivity and specificity of the tests; the risk/benefit to the patient ratio; the financial cost/benefit to the client ratio; the incidence or prevalence of the condition being tested for and the importance of the condition being tested for (e.g. hypoadrenocorticism is uncommon, but the consequences of failing to diagnose it may be serious).

After the results of initial testing have been obtained the clinician may be in a position to make a definitive diagnosis. Often, however, it is necessary to refine the differential list and select further appropriate testing. The differential list may be reformulated as often as is necessary until a diagnosis for that problem is made. Often, a single diagnosis will tie in all the problems satisfactorily. However, in many cases, particularly in geriatric patients, concurrent disorders will require multiple diagnoses.

For problem cases in which a clear diagnosis is not made or the patient fails to respond to treatment as expected, returning to the beginning with the history and physical examination, with the condition often having progressed, can be helpful. However, very few tests are 100% sensitive and specific, and many 'definitive' diagnoses in fact leave room for some doubt. The clinician should never be afraid to revise the initial diagnosis if further evidence comes to light. Those who are concerned that failing to make the correct diagnosis in every case is somehow a sign of inferior clinical abilities should take heart from a 2004 study from the School of Veterinary Medicine at the University of California. In this paper, clinical and post-mortem diagnoses of 623 dogs treated between 1989 and 1999 at the Veterinary Teaching Hospital were compared. It was found that the post-mortem diagnosis, presumed to be the correct diagnosis, differed from the clinical diagnosis in approximately one-third of cases.

This book is organised into five parts. Part 1 deals with signs likely to be uncovered during history taking. Part 2 deals with signs encountered at the physical examination. Part 3 deals with imaging findings, Part 4 with clinicopathological findings and Part 5 with electrophysiological findings.

The individual lists are largely organised alphabetically. The more common conditions are labelled with an asterisk, but, as stated above, whether

a condition is considered to be common is largely a matter of subjective opinion. Those conditions that are predominantly or exclusively found only in dogs are marked with a (D) and those in cats are marked with a (C).

Sources for the information in this book are wide ranging. A large number of textbooks, were consulted, but in most cases it was necessary to expand the lists found in these sources, using information from veterinary journals and conference proceedings.

Although there are undoubtedly omissions from some of the lists, encompassing as this book does virtually the whole of small animal veterinary medicine, we have tried to make it as comprehensive as possible. We would be happy to hear of any omissions, corrections or comments on the text, which can be e-mailed with any supporting references to alex.gough@bath-vetrefferrals.co.uk.

The following colleagues provided comments on the text of the first edition for which we are grateful: Simon Platt BVM&S DipACVIM DipECVN MRCVS, Chris Belford BVSc DVSc FACVSc RCVS Specialist Pathologist Dip Wldl Mgt, Theresa McCann BVSc CertSAM MRCVS, Rosie McGregor BVSc CertVD CertVC MRCVS, Mark Bush MA VetMB CertSAS MRCVS, Alison Thomas BVSc CertSAM MRCVS, Mark Maltman BVSc CertSAM CertVC MRCVS, Panagiotis Mantis DVM DipECVDI MRCVS, Axiom Laboratories, Stuart Caton BA VetMB CertSAM MRCVS, Tim Knott BSc BVSc CertVetOphth MRCVS, Lisa Phillips CertVR BVetMed MRCVS, Roderick MacGregor BVM&S CertVetOphth CertSAS MRCVS and Mark Owen BVSc CertSAO MRCVS. Any errors are of course ours and not theirs. We are also grateful to Justinia Wood at Wiley for her support in this project.

## Key

\* = more common condition

(D) = condition seen exclusively or predominantly in dogs

(C) = condition seen exclusively or predominantly in cats

q.v. = more information can be found on this condition elsewhere in this book – see Index

# PART 1

## HISTORICAL SIGNS

### 1.1 General, systemic and metabolic historical signs

#### 1.1.1 Polyuria/polydipsia

##### **Diet**

Increased salt intake  
Very-low-protein diet

##### **Drugs/toxins**

Aminophylline  
Corticosteroids  
Delmadinone acetate  
Diuretics  
Ethylene glycol  
Indomethacin

- Lilies

Lithium

- Melamine

NPK fertilisers  
Paraquat  
Phenobarbitone  
Potassium bromide

Primidone  
Proligestone

- Raisins/grapes

Terfenadine  
Theophylline  
Vitamin D rodenticides

## **Electrolyte disorders**

Hypercalcaemia *q.v.*  
Hypernatraemia *q.v.*

- Primary
- Secondary to dehydration, lack of intake, excessive loss of water, severe vomiting/diarrhoea, etc.

Hypokalaemia *q.v.*

## **Endocrine disease**

Acromegaly  
Diabetes mellitus\*  
Diabetes insipidus

- Central
- Nephrogenic

Hyperadrenocorticism  
Hyperthyroidism\* (C)  
Hypoadrenocorticism (D)  
Insulinoma  
Pheochromocytoma  
Primary hyperaldosteronism  
Primary hyperparathyroidism

## **Hepatobiliary disease, e.g.**

Hepatic neoplasia\* *q.v.*  
Hepatitis/cholangiohepatitis\* *q.v.*

## **Infectious disease, e.g.**

Toxaemia, e.g.

- Pyometra\*

## **Miscellaneous**

Congenital lack of ADH receptors  
Hypothalamic disease  
Pericardial effusion

Polycythaemia  
Psychogenic\*

## Neoplasia\*

## Physiological

Exercise  
High environmental temperature

## Renal disorders

Acute kidney injury\* *q.v.*  
Chronic kidney disease\* *q.v.*  
Following urethral obstruction\*  
Glomerulonephritis  
Primary renal glycosuria  
Pyelonephritis  
Renal medullary washout

*Note:* Polyuria and polydipsia are considered together here, since one will lead to the other, with only a few exceptions. These include polydipsia in the face of obstructive lower urinary tract disease or oliguric renal failure and polyuria which is not matched by fluid intake, in which case dehydration will rapidly follow. None of these scenarios are encountered commonly in practice. Polydipsia without polyuria can occur in situations of increased urinary loss of fluid, such as after strenuous exercise.

### 1.1.2 Weight loss

## Decreased nutrient intake

Anorexia\* *q.v.*  
Diet

- Poor-quality diet
- Underfeeding

Dysphagia *q.v.*  
Oral disease, e.g.

- Dental disease
- Masticatory myositis
- Temporomandibular joint disease

Regurgitation *q.v.*

**Increased nutrient loss**

Burns

Chronic blood loss

- Epistaxis *q.v.*
- Haematemesis *q.v.*
- Haematuria *q.v.*
- Melaena *q.v.*

Diabetes mellitus/diabetic ketoacidosis\*

Effusions *q.v.*

Fanconi syndrome (D)

Intestinal parasites\*

Neoplasia\*

Protein-losing enteropathy\*

Protein-losing nephropathy

**Increased nutrient use**

*Endocrine, e.g.*

Hyperthyroidism\* (C)

*Neoplasia\**

*Physiological*

Cold environment

Exercise

Fever *q.v.*

Lactation\*

Pregnancy\*

**Maldigestion/malabsorption**

Cardiac failure

Exocrine pancreatic insufficiency

Hepatic failure/bile salt deficiency *q.v.*

Hypoadrenocorticism (D)

Neoplasia\*

Renal disease\* *q.v.*

Small intestinal disease\* *q.v.*, e.g.

- Antibiotic-responsive diarrhoea
- Inflammatory bowel disease
- Lymphangiectasia

**Regurgitation and vomiting\* *q.v.***

### 1.1.3 Weight gain

Decreased energy utilisation, e.g.

- Decreased exercise

### Fluid accumulation

Ascites\* *q.v.*

Peripheral oedema *q.v.*

Pleural effusion

### Increased body fat

*Overeating*

Boredom

Excessive appetite (normal in some breeds)

High-calorie diets

Overfeeding\*

*Endocrinopathies*

Acromegaly

Hyperadrenocorticism

Hypogonadism

Hypothyroidism\* (D)

Insulinoma

### Increased organ size

Hepatomegaly\* *q.v.*

Renomegaly *q.v.*

Splenomegaly\* *q.v.*

Uterine enlargement *q.v.*

- Pregnancy\*
- Pyometra\*

### Neoplasia

Large abdominal mass (often associated with poor body condition)\*

Drugs, e.g.

- Corticosteroids

### 1.1.4 Polyphagia

#### **Behavioural/psychological**

Boredom

Normal in some breeds\*

Psychogenic, e.g. problem with satiety centre

#### **Diet**

Highly palatable food\*

Poor-quality food

#### **Drugs, e.g.**

Benzodiazepines

Corticosteroids

Mirtazapine

Progestagens

#### **Endocrine**

Acromegaly

Diabetes mellitus\*

Hyperadrenocorticism

Hyperthyroidism \*(C)

Insulinoma

#### **Increased nutrient loss, e.g.**

Exocrine pancreatic insufficiency

Malabsorption

- Small intestinal disease

#### **Increased nutrient use, e.g.**

Neoplasia

#### **Malassimilation *q.v.***

#### **Physiological**

Cold environment

Increased exercise

Lactation

Pregnancy

### 1.1.5 Anorexia/inappetence

#### **Anorexia, primary**

Intracranial disease, e.g.

- Hypothalamic neoplasia

#### **Anorexia, secondary**

Anosmia

- Chronic rhinitis *q.v.*
- Nasal neoplasia
- Other nasal disease
- Neurological disease

Endocrine disease, e.g.

- Diabetic ketoacidosis
- Hypoadrenocorticism (D)

Fever\* *q.v.*

Gastrointestinal disease *q.v.*, e.g.

- Gastritis
- Inflammatory bowel disease\*

Heart disease, e.g.

- Cardiac failure\*

Hepatic disease\* *q.v.*

Infection\*

Metabolic abnormalities, e.g.

- Hypercalcaemia *q.v.*
- Hypokalaemia *q.v.*

Pain\*

Pancreatic disease\*, e.g.

- Pancreatitis

Renal disease\* *q.v.*

Respiratory disease, e.g.

- Airway disease\* *q.v.*
- Diaphragmatic hernia
- Pleural effusion\* *q.v.*
- Pneumonia *q.v.*

#### **Diet**

Recent dietary changes\*

Unpalatable diet\*

**Difficulty with mastication**

Dental disease\*

Lingual disease

Oral neoplasia\*

Oral ulceration, e.g.

- Ingestion of caustic or acidic substances\*
- Renal disease

**Difficulty with prehension**

Blindness *q.v.*

*Myopathy, e.g.*

- Masticatory myositis
- Tetanus

*Pain on opening jaw, e.g.*

- Mandibular or maxillary fracture
- Retrobulbar abscess
- Skull fractures
- Soft tissue trauma
- Temporomandibular joint disease

*Trigeminal nerve disease, e.g.*

- Neoplasia
- Trigeminal neuritis

**Difficulty with swallowing**

*Pharyngeal disease*

Foreign body\*

Neoplasia

Neurological disease

Ulceration

*Oesophageal disease, e.g.*

Foreign body\*

Megaoesophagus

Neoplasia

Stricture

Ulceration

Vascular ring anomaly

*Drugs*

- Acetazolamide
- Amiodarone
- Amphotericin B
- Bethanechol
- Bromocriptine
- Butorphanol
- Cardiac glycosides
- Chlorambucil
- Diazoxide
- Doxorubicin
- Fentanyl
- Hydralazine
- Itraconazole
- Ketoconazole
- Melphalan
- Methimazole
- Mitotane
- Nicotinamide
- Oxytetracycline (C)
- Penicillamine
- Theophylline
- Trimethoprim/sulphonamide (C)

**Psychological/behavioural\* factors**

Altered schedule  
New family members  
New house  
New pets

**1.1.6 Failure to grow****With good body condition**

Chondrodystrophy (normal in many breeds)\* (D)

Endocrine disorders

- Congenital hyposomatotropism (pituitary dwarfism)
- Congenital hypothyroidism

## With poor body condition

Dietary intolerance

Exocrine pancreatic insufficiency\*

*Inadequate nutrient intake*

- Anorexia *q.v.*
- Poor-quality diet
- Underfeeding

*Cardiac disorders, e.g.*

- Congenital
- Endocarditis

*Endocrine disease*

- Diabetes insipidus
- Diabetes mellitus\*
- Hypoadrenocorticism (D)

*Gastrointestinal disease, e.g.*

- Histoplasmosis
- Obstruction, e.g.
  - Foreign body\*
  - Intussusception\*
- Parasites\*

*Hepatic disorders, e.g.*

- Hepatitis *q.v.*
- Portosystemic shunt

*Inflammatory disease*

*Oesophageal disorders, e.g.*

- Megaoesophagus *q.v.*
- Vascular ring anomaly (e.g. persistent right aortic arch)

*Renal disease*

- Congenital kidney disease
- Glomerulonephritis
- Pyelonephritis

## 1.1.7 Syncope/collapse

### Cardiovascular dysfunction

*Bradyarrhythmias q.v., e.g.*

- High-grade second-degree heart block
- Sick sinus syndrome (D)