

Differential Diagnosis in Small Animal Medicine



Alex Gough



Blackwell
Publishing

Contents

<i>Introduction</i>	<i>xiii</i>
Part 1: Historical Signs	1
1.1 General, systemic and metabolic historical signs	1
1.1.1 Polyuria/polydipsia	1
1.1.2 Weight loss	3
1.1.3 Weight gain	4
1.1.4 Polypphagia	5
1.1.5 Anorexia/inappetence	6
1.1.6 Failure to grow	8
1.1.7 Syncope/collapse	9
1.1.8 Weakness	13
1.2 Gastrointestinal/abdominal historical signs	16
1.2.1 Ptyalism/salivation/hypersalivation	16
1.2.2 Gagging/retching	18
1.2.3 Dysphagia	19
1.2.4 Regurgitation	20
1.2.5 Vomiting	21
1.2.6 Diarrhoea	26
1.2.7 Melena	31
1.2.8 Haematemesis	33
1.2.9 Haematochezia	34
1.2.10 Constipation/obstipation	36
1.2.11 Faecal tenesmus/dyschezia	38
1.2.12 Faecal incontinence	39
1.2.13 Flatulence/borborygmus	40
1.3 Cardiorespiratory historical signs	40
1.3.1 Coughing	40
1.3.2 Dyspnoea/tachypnoea	42
1.3.3 Sneezing and nasal discharge	43
1.3.4 Epistaxis	44
1.3.5 Haemoptysis	46
1.3.6 Exercise intolerance	47
1.4 Dermatological historical signs	48
1.4.1 Pruritus	48
1.5 Neurological historical signs	51
1.5.1 Seizures	51
1.5.2 Trembling/shivering	55

1.5.3	Ataxia/conscious proprioceptive deficits	57
1.5.4	Paresis/paralysis	65
1.5.5	Coma/stupor	70
1.5.6	Altered behaviour – general changes	72
1.5.7	Altered behaviour – specific behavioural problems	74
1.5.8	Deafness	75
1.5.9	Multifocal neurological disease	77
1.6	Ocular historical signs	80
1.6.1	Blindness/visual impairment	80
1.6.2	Epiphora/tear overflow	82
1.7	Musculoskeletal historical signs	83
1.7.1	Forelimb lameness	83
1.7.2	Hind limb lameness	87
1.7.3	Multiple joint/limb lameness	90
1.8	Reproductive historical signs	91
1.8.1	Failure to observe oestrus	91
1.8.2	Irregular seasons	92
1.8.3	Infertility in the female with normal oestrus	94
1.8.4	Male infertility	95
1.8.5	Vaginal/vulval discharge	97
1.8.6	Abortion	98
1.8.7	Dystocia	98
1.8.8	Neonatal mortality	100
1.9	Urological historical signs	101
1.9.1	Pollakiuria/dysuria/stranguria	101
1.9.2	Polyuria/polydipsia	101
1.9.3	Anuria/oliguria	102
1.9.4	Haematuria	102
1.9.5	Urinary incontinence/inappropriate urination	104
Part 2: Physical Signs		106
2.1	General/miscellaneous physical signs	106
2.1.1	Abnormalities of body temperature – hyperthermia	106
2.1.2	Abnormalities of body temperature – hypothermia	110
2.1.3	Enlarged lymph nodes	111
2.1.4	Diffuse pain	113
2.1.5	Peripheral oedema	114
2.1.6	Hypertension	115
2.1.7	Hypotension	116
2.2	Gastrointestinal/abdominal physical signs	118
2.2.1	Oral lesions	118
2.2.2	Abdominal distension	120
2.2.3	Abdominal pain	120
2.2.4	Perianal swelling	123
2.2.5	Jaundice	124
2.2.6	Abnormal liver palpation	126

2.3	Cardiorespiratory physical signs	128
2.3.1	Dyspnoea/tachypnoea	128
2.3.2	Pallor	133
2.3.3	Shock	133
2.3.4	Cyanosis	135
2.3.5	Ascites	136
2.3.6	Peripheral oedema	136
2.3.7	Abnormal respiratory sounds	137
2.3.8	Abnormal heart sounds	138
2.3.9	Abnormalities in heart rate	143
2.3.10	Jugular distension/positive hepatojugular reflux	145
2.3.11	Jugular pulse components	145
2.3.12	Alterations in arterial pulse	146
2.4	Dermatological signs	147
2.4.1	Scaling	147
2.4.2	Pustules and papules (including miliary dermatitis)	149
2.4.3	Nodules	151
2.4.4	Pigmentation disorders (coat or skin)	153
2.4.5	Alopecia	155
2.4.6	Erosive/ulcerative skin disease	157
2.4.7	Otitis externa	158
2.4.8	Pododermatitis	160
2.4.9	Disorders of the claws	162
2.4.10	Anal sac/perianal disease	163
2.5	Neurological signs	164
2.5.1	Abnormal cranial nerve (CN) responses	164
2.5.2	Vestibular disease (head tilt, nystagmus, circling, leaning, falling, rolling)	167
2.5.3	Horner's syndrome	171
2.5.4	Hemineglect syndrome	172
2.5.5	Spinal disorders	172
2.6	Ocular signs	174
2.6.1	Red eye	174
2.6.2	Corneal opacification	178
2.6.3	Corneal ulceration/erosion	179
2.6.4	Lens lesions	180
2.6.5	Retinal lesions	182
2.6.6	Intraocular haemorrhage/hyphaema	183
2.6.7	Abnormal appearance of anterior chamber	184
2.7	Musculoskeletal signs	185
2.7.1	Muscular atrophy or hypertrophy	185
2.7.2	Trismus ('lockjaw')	186
2.7.3	Weakness	187
2.8	Urogenital physical signs	187
2.8.1	Kidneys abnormal on palpation	187
2.8.2	Bladder abnormalities	189
2.8.3	Prostate abnormal on palpation	190

2.8.4	Uterus abnormal on palpation	191
2.8.5	Testicular abnormalities	191
2.8.6	Penis abnormalities	192
Part 3: Radiographic and Ultrasonographic Signs		193
3.1	Thoracic radiography	193
3.1.1	Artefactual causes of increased lung opacity	193
3.1.2	Increased bronchial pattern	193
3.1.3	Increased alveolar pattern	195
3.1.4	Increased interstitial pattern	199
3.1.5	Increased vascular pattern	201
3.1.6	Decreased vascular pattern	202
3.1.7	Cardiac diseases that may be associated with a normal cardiac silhouette	203
3.1.8	Increased size of cardiac silhouette	203
3.1.9	Decreased size of cardiac silhouette	205
3.1.10	Abnormalities of the ribs	205
3.1.11	Abnormalities of the oesophagus	206
3.1.12	Abnormalities of the trachea	209
3.1.13	Pleural effusion	211
3.1.14	Pneumothorax	212
3.1.15	Abnormalities of the diaphragm	213
3.1.16	Mediastinal abnormalities	214
3.2	Abdominal radiography	217
3.2.1	Liver	217
3.2.2	Spleen	219
3.2.3	Stomach	221
3.2.4	Intestines	224
3.2.5	Ureters	230
3.2.6	Bladder	230
3.2.7	Urethra	233
3.2.8	Kidneys	234
3.2.9	Loss of intra-abdominal contrast	236
3.2.10	Prostate	238
3.2.11	Uterus	239
3.2.12	Abdominal masses	239
3.2.13	Abdominal calcification/mineral density	240
3.3	Skeletal radiography	241
3.3.1	Fractures	241
3.3.2	Altered shape of long bones	242
3.3.3	Dwarfism	243
3.3.4	Delayed ossification/growth plate closure	243
3.3.5	Increased radiopacity	243
3.3.6	Periosteal reactions	244
3.3.7	Bony masses	245
3.3.8	Osteopenia	246
3.3.9	Osteolysis	247

3.3.10	Mixed osteolytic/osteogenic lesions	248
3.3.11	Joint changes	248
3.4	Radiography of the head and neck	251
3.4.1	Increased radiopacity/bony proliferation of the maxilla	251
3.4.2	Decreased radiopacity of the maxilla	251
3.4.3	Increased radiopacity/bony proliferation of the mandible	252
3.4.4	Decreased radiopacity of the mandible	252
3.4.5	Increased radiopacity of the tympanic bulla	253
3.4.6	Decreased radiopacity of the nasal cavity	253
3.4.7	Increased radiopacity of the nasal cavity	254
3.4.8	Increased radiopacity of the frontal sinuses	255
3.4.9	Increased radiopacity of the pharynx	255
3.4.10	Thickening of the soft tissues of the head and neck	256
3.4.11	Decreased radiopacity of the soft tissues of the head and neck	257
3.4.12	Increased radiopacity of the soft tissues of the head and neck	257
3.5	Radiography of the spine	258
3.5.1	Normal and congenital variation in vertebral shape and size	258
3.5.2	Acquired variation in vertebral shape and size	259
3.5.3	Changes in vertebral radiopacity	261
3.5.4	Abnormalities in the intervertebral space	262
3.5.5	Contrast radiography of the spine (myelography)	263
3.6	Thoracic ultrasonography	265
3.6.1	Pleural effusion	265
3.6.2	Mediastinal masses	266
3.6.3	Pericardial effusion	266
3.6.4	Altered chamber dimensions	267
3.6.5	Changes in ejection phase indices of left ventricular performance	270
3.7	Abdominal ultrasonography	272
3.7.1	Renal disease	272
3.7.2	Hepatobiliary disease	274
3.7.3	Splenic disease	277
3.7.4	Pancreatic disease	279
3.7.5	Adrenal disease	279
3.7.6	Urinary bladder disease	280
3.7.7	Gastrointestinal disease	281
3.7.8	Ovarian and uterine disease	283
3.7.9	Prostatic disease	284
3.7.10	Ascites	285
3.8	Ultrasonography of other regions	288
3.8.1	Testes	288
3.8.2	Eyes	288
3.8.3	Neck	290
	Part 4: Laboratory Findings	292
4.1	Biochemical findings	292
4.1.1	Albumin	292

4.1.2	Alanine transferase	293
4.1.3	Alkaline phosphatase	295
4.1.4	Ammonia	296
4.1.5	Amylase	297
4.1.6	Aspartate aminotransferase	298
4.1.7	Bilirubin	298
4.1.8	Bile acids/dynamic bile acid test	299
4.1.9	C-reactive protein	300
4.1.10	Cholesterol	301
4.1.11	Creatinine	301
4.1.12	Creatine kinase	302
4.1.13	Ferritin	303
4.1.14	Fibrinogen	303
4.1.15	Folate	304
4.1.16	Fructosamine	304
4.1.17	Gamma-glutamyl transferase	305
4.1.18	Gastrin	306
4.1.19	Globulins	306
4.1.20	Glucose	307
4.1.21	Iron	309
4.1.22	Lactate dehydrogenase	310
4.1.23	Lipase	311
4.1.24	Triglycerides	312
4.1.25	Trypsin-like immunoreactivity	313
4.1.26	Urea	313
4.1.27	Vitamin B ₁₂ (cobalamin)	316
4.1.28	Zinc	317
4.2	Haematological findings	317
4.2.1	Regenerative anaemia	317
4.2.2	Poorly-/non-regenerative anaemia	320
4.2.3	Polycythaemia	323
4.2.4	Thrombocytopenia	324
4.2.5	Thrombocytosis	327
4.2.6	Neutrophilia	328
4.2.7	Neutropenia	330
4.2.8	Lymphocytosis	331
4.2.9	Lymphopenia	332
4.2.10	Monocytosis	333
4.2.11	Eosinophilia	334
4.2.12	Eosinopenia	335
4.2.13	Mastocythaemia	335
4.2.14	Basophilia	335
4.2.15	Increased buccal mucosal bleeding time (disorders of primary haemostasis)	336
4.2.16	Increased prothrombin time (disorders of extrinsic and common pathways)	337
4.2.17	Increased partial thromboplastin time or activated clotting time (disorders of intrinsic and common pathways)	338
4.2.18	Increased fibrin degradation products	338

4.2.19	Decreased fibrinogen levels	338
4.2.20	Decreased antithrombin III levels	339
4.3	Electrolyte and blood gas findings	339
4.3.1	Total calcium	339
4.3.2	Chloride	342
4.3.3	Magnesium	343
4.3.4	Potassium	345
4.3.5	Phosphate	347
4.3.6	Sodium	348
4.3.7	pH	350
4.3.8	paO ₂	353
4.3.9	Total CO ₂	354
4.3.10	Bicarbonate	354
4.3.11	Base excess	354
4.4	Urinalysis findings	354
4.4.1	Alterations in specific gravity	354
4.4.2	Abnormalities in urine chemistry	356
4.4.3	Abnormalities in urine sediment	360
4.4.4	Infectious agents	362
4.5	Cytological findings	364
4.5.1	Tracheal/bronchoalveolar lavage	364
4.5.2	Nasal flush cytology	366
4.5.3	Liver cytology	367
4.5.4	Kidney cytology	369
4.5.5	Skin scrapes/hair plucks/tape impressions	369
4.5.6	Cerebrospinal fluid (CSF) analysis	370
4.5.7	Fine needle aspiration of cutaneous/subcutaneous masses	372
4.6	Hormones/endocrine testing	373
4.6.1	Thyroxine	373
4.6.2	Parathyroid hormone	374
4.6.3	Cortisol (baseline or post-ACTH stimulation test)	375
4.6.4	Insulin	376
4.6.5	ACTH	376
4.6.6	Vitamin D (1,25 dihydroxycholecalciferol)	376
4.6.7	Testosterone	377
4.6.8	Progesterone	377
4.6.9	Oestradiol	378
4.6.10	Atrial natriuretic peptide	378
4.6.11	Modified water deprivation test (in the investigation of polyuria/polydipsia)	379
4.7	Faecal analysis findings	379
4.7.1	Faecal blood	379
4.7.2	Faecal parasites	380
4.7.3	Faecal culture	380
4.7.4	Faecal fungal infections	381
4.7.5	Undigested food residues	381

Part 5: Electrodiagnostic Testing	382
5.1 ECG findings	382
5.1.1 Alterations in P wave	382
5.1.2 Alterations in QRS complex	383
5.1.3 Alterations in P-R relationship	384
5.1.4 Alterations in S-T segment	387
5.1.5 Alterations in Q-T interval	387
5.1.6 Alterations in T wave	388
5.1.7 Alterations in baseline	388
5.1.8 Rhythm alterations	389
5.1.9 Alterations in rate	392
5.2 Electromyographic findings	394
5.3 Nerve conduction velocity findings	395
5.4 Electroencephalography findings	395
Part 6: Diagnostic Procedures	397
6.1 Fine-needle aspiration (FNA)	397
6.2 Bronchoalveolar lavage	398
6.3 Gastrointestinal (GI) endoscopic biopsy	399
6.4 Electrocardiography (ECG)	400
6.5 Magnetic resonance imaging (MRI)	401
6.5.1 Brain	401
6.5.2 Spine	402
6.5.3 Nasal passages	402
6.6 Ultrasound-guided biopsy	402
6.7 Cerebrospinal fluid (CSF) collection	403
6.8 Bone marrow aspiration	404
6.9 Thoraco-, pericardio-, cysto- and abdominocentesis	406
6.9.1 Thoracocentesis	406
6.9.2 Pericardiocentesis	407
6.9.3 Cystocentesis	408
6.9.4 Abdominocentesis/diagnostic peritoneal lavage	409
6.10 Blood pressure measurement	410
6.10.1 Central venous pressure	410
6.10.2 Indirect blood pressure measurement by Doppler technique	411
6.11 Dynamic testing	412
6.11.1 ACTH stimulation test	412
6.11.2 Low-dose dexamethasone suppression test (LDDST)	413
6.11.3 Bile acid stimulation test	413
6.12 Haematological techniques	414
6.12.1 In saline autoagglutination test	414
6.12.2 Preparation of a blood smear	414

6.12.3 Buccal mucosal bleeding time	415
6.12.4 Arterial blood sampling	416
6.13 Water deprivation test	416
6.14 Serial blood glucose curve	418
6.15 Skin scraping	419
6.16 Schirmer tear test	419
6.17 Nasal flush cytology/nasal biopsy	420
6.18 Contrast radiography	421
6.18.1 Barium meal/swallow	421
6.18.2 Intravenous urography	422
6.18.3 Contrast cystography	423
6.18.4 Myelography	425
6.19 Contrast echocardiography	426
6.20 Cranial nerve (CN) examination	426
Part 7: Diagnostic Algorithms	429
7.1 Bradycardia	430
7.2 Tachycardia	431
7.3 Hypoalbuminaemia	432
7.4 Non-regenerative anaemia	433
7.5 Regenerative anaemia	434
7.6 Jaundice	435
7.7 Hypokalaemia	436
7.8 Hyperkalaemia	437
7.9 Hypocalcaemia	438
7.10 Hypercalcaemia	439
7.11 Systemic hypertension	440
Appendix A: History Record	441
Appendix B: Physical Examination Record	443
Appendix C: Neurological Examination Chart	445
Appendix D: Cardiology Consultation Form	448
<i>Bibliography and Further Reading</i>	451
<i>Index</i>	453

Colour plate section follows p. 240