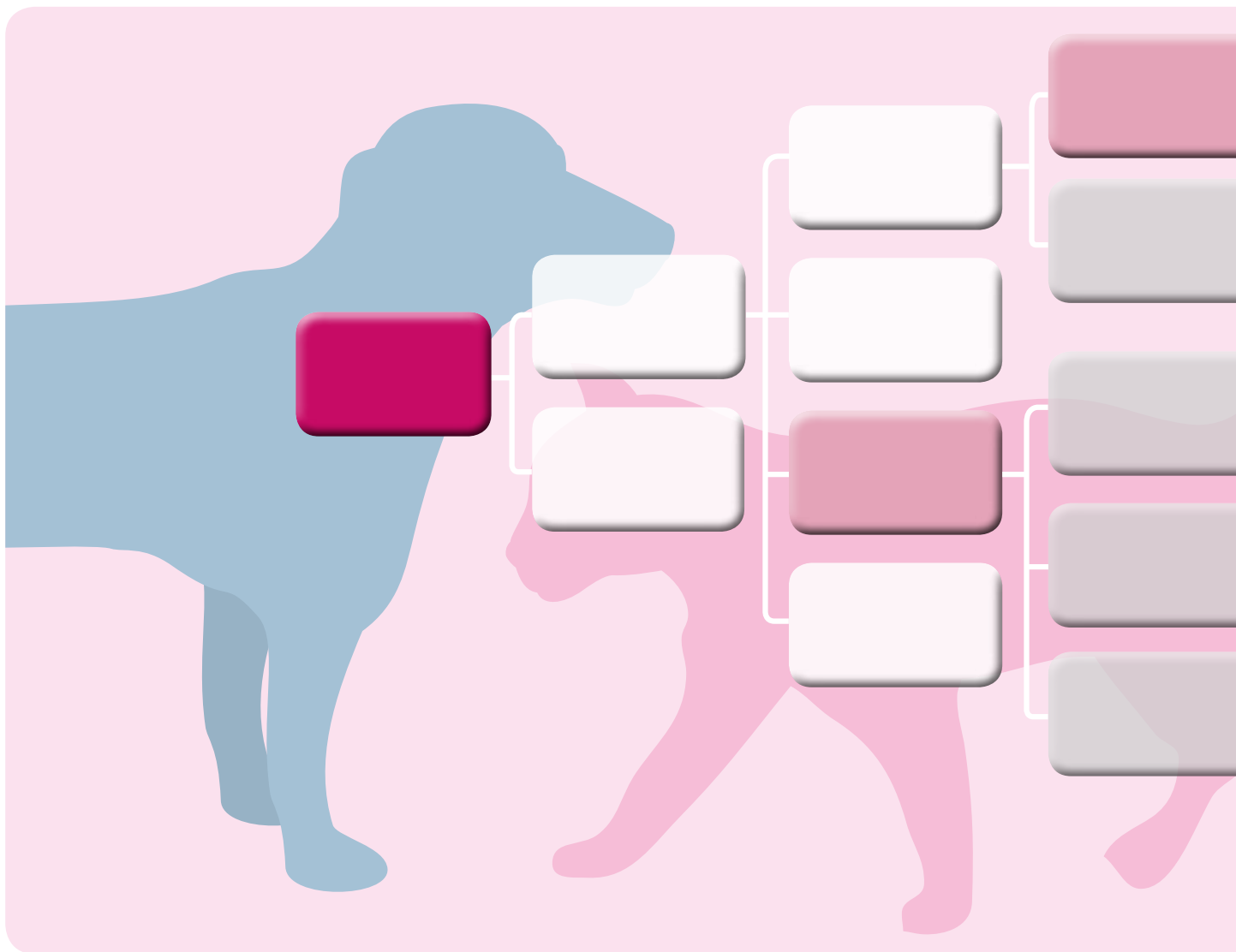


Katrin Hartmann | Gregor Berg | Stefanie Berg (eds.)

Rule outs in small animal medicine

Problem-oriented assessment of problems in physical examination and clinical pathology

2nd, revised edition



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In cooperation with

Roswitha Dorsch • Andrea Fischer • Johannes Hirschberger •
Ralf Müller • Felix Neuerer • Stefan Unterer • Bianka Schulz • Gerhard Wess

2nd, revised edition

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2nd, revised edition

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Foreword

We, the authors and editors, have designed this book for veterinary students in their clinical years, for veterinarians during their internal medicine training (residents, interns, vets training to be specialists), and veterinarians in practice. The book is based on the doctoral theses of Dr. Gregor Berg and Dr. Stefanie Berg (née Schmid), which were produced between 2006 and 2009 at the Clinic of Small Animal Medicine of the Center for Clinical Veterinary Medicine of the Ludwig-Maximilians-Universität Munich, Munich, Germany.

This book serves both as an introduction to the problem-oriented approach to clinical and laboratory problems (i.e. so-called “rule outs”) and for a better understanding of the pathophysiological processes hidden behind a particular problem. This book is supposed to serve as a handbook and aid for everyday work with small animal patients. The format of a loose-leaf ring binder was therefore chosen so that additional notes can and should be inserted.

In the problem-oriented approach, every problem affecting a patient is divided into specific rule outs; so that the possible causes of the problem are summarised in causal groups. This subdivision is done logically, mainly according to their pathophysiological relationships. Until now, there has been no general classification of problems in veterinary medicine, and such rule outs had not been written down. As many veterinarians and students asked us where they could find the rule outs being taught by us, we decided to compile them into this book – the first of its kind.

Rule outs are a tool for the detective work undertaken by a veterinarian and they can help us to solve the most complex internal medical cases. At the same time, a students’ own initiative is stimulated and the learning effect maximised. That’s what makes internal medicine fun!

This book was only made possible by the intensive cooperation of my faculty members, who invested a lot of time in setting up the rule outs and spent innumerable hours in discussion with me about the most reasonable way to classifying them up. I wish, therefore, to thank my faculty members very warmly for supporting me in this work. You are the best and nicest group of specialists that a head of a clinic could ever wish for.

I also wish to thank my internal medicine colleagues at the University of Athens, Georgia, USA (especially Prof. Craig Greene, Prof. Jeanne Barsanti, Prof. Clay Calvert and Prof. Bente Flatland), with whom I have worked together for many years, as well as all visiting professors from the United States who have regularly visited us in Munich and who introduced us to the fascinating world of rule outs. In addition, I wish to thank the Schlütersche Publishing Company for the time-consuming creation and excellent publication of this book; especially Dr. Ulrike Oslage who supported us with our rather unusual idea from the start.

I wish you, dear reader, a lot of enjoyment while reading, and that this book and its rule outs will help you with your day-to-day work and give you as much pleasure as it does us. We would appreciate any suggestions for improvement of the book and its contents.

Munich, Germany; Summer 2019

Katrin Hartmann

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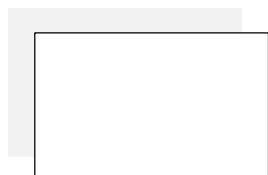
Abbreviations

ADH	antidiuretic hormone	IBD	inflammatory bowel disease
AHDS	Acute haemorrhagic diarrhea syndrome	L	lumbar vertebra
ALT	alanine aminotransferase	LBBB	left bundle branch block
ALP	alkaline phosphatase	LMN	lower motor neuron
aPTT	activated partial thromboplastin time	m.	muscle
assoc.	associated	min	Minute
AST	aspartate aminotransferase	NaCl	sodium chloride
AV	atrioventricular	n.	nerve
BOAS	brachycephalic obstructive airway syndrome	NH ₃	ammonia
C	cervical vertebra	NSAIDs	non-steroidal anti-inflammatory drugs
CIRD	canine infectious respiratory disease	O ₂	oxygen
CK	creatinine kinase	p.	page
CNS	central nervous system	pCO ₂	carbon dioxide partial pressure
CRT	capillary refill time	PDA	patent ductus arteriosus
CTVT	canine transmissible venereal tumour	PD	polydipsia
DCM	dilated cardiomyopathy	PD/PU	polydipsia/polyuria
DIC	disseminated intravascular coagulopathy	pp.	pages
e.g.	for example (<i>exempli gratia</i>)	PU	polyuria
esp.	especially	RBBB	right bundle branch block
FeLV	feline leukaemia virus	RCM	restrictive cardiomyopathy
FIC	feline idiopathic cystitis	S	sacral vertebra
FIP	feline infectious peritonitis	SAM	systolic anterior motion
FIV	feline immunodeficiency virus	SIADH	syndrome of inappropriate ADH secretion
FLUTD	feline lower urinary tract disease	T	thoracic vertebra
FURTD	feline upper respiratory tract disease	T ₄	thyroxin
GME	granulomatous meningoencephalitis	TCC	transitional cell carcinoma
H ⁺	proton	TNF-α	tumour necrosis factor-α
HCM	hypertrophic cardiomyopathy	UCM	unclassified cardiomyopathy
HCO ₃ ⁻	bicarbonate	UMN	upper motor neuron
HR	heart rate	UP:UC	urinary protein to creatinine ratio
		VSD	ventricular septal defect

Legend



Start of a diagnostic path/problem



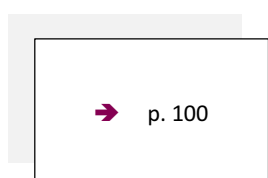
Intermediary steps/decision-making steps



Problem



Important causes
(only the most important causes are listed)

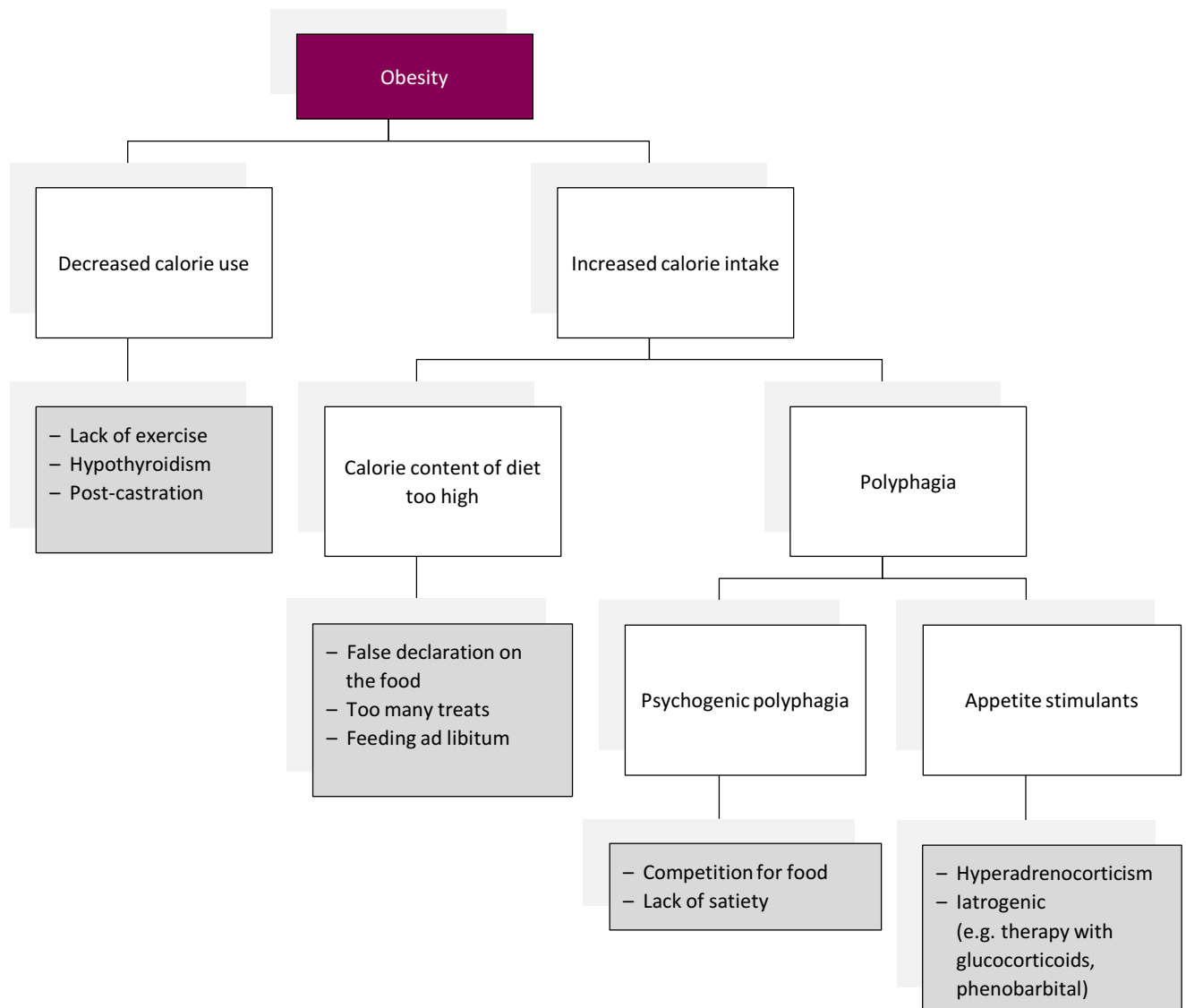


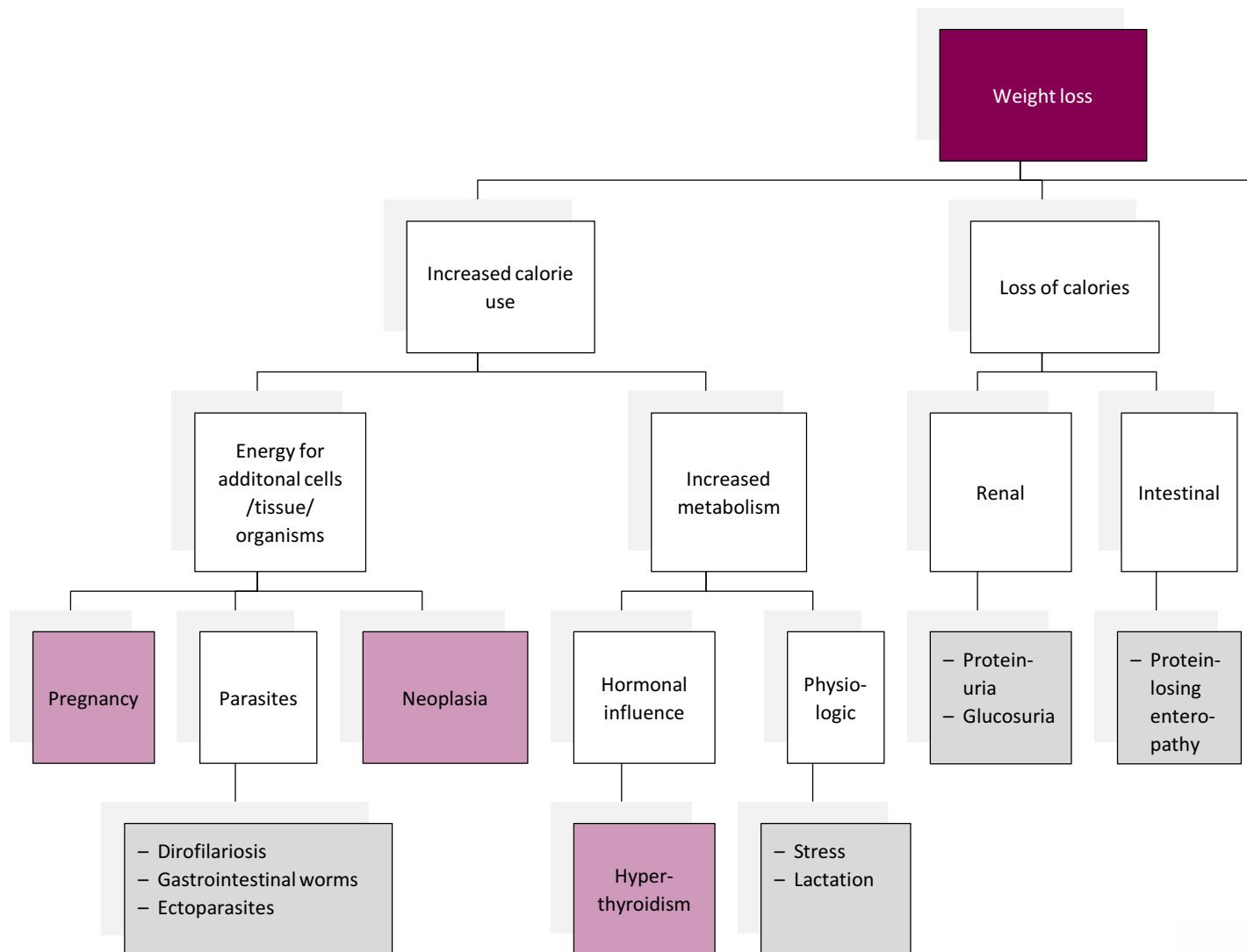
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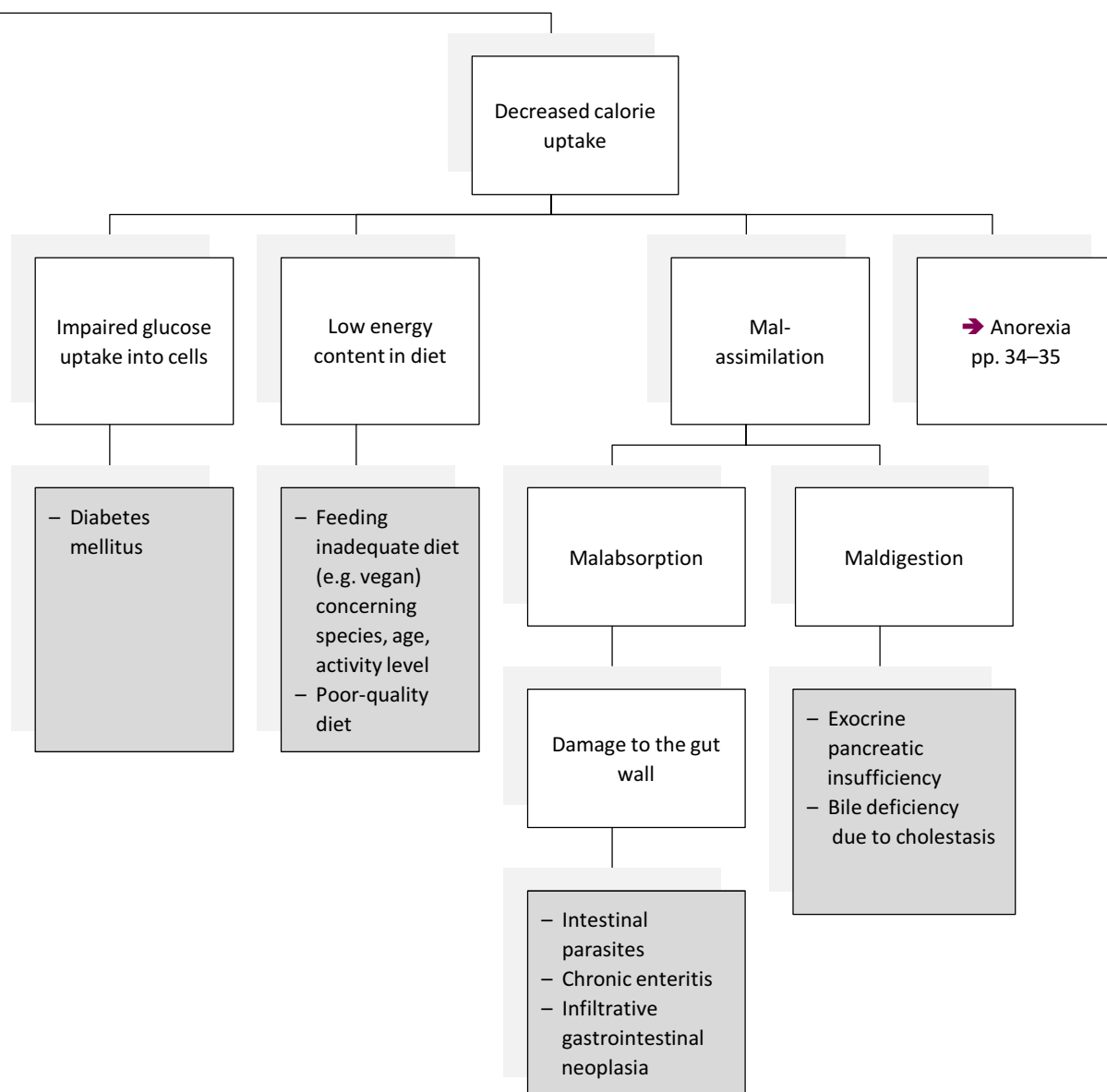
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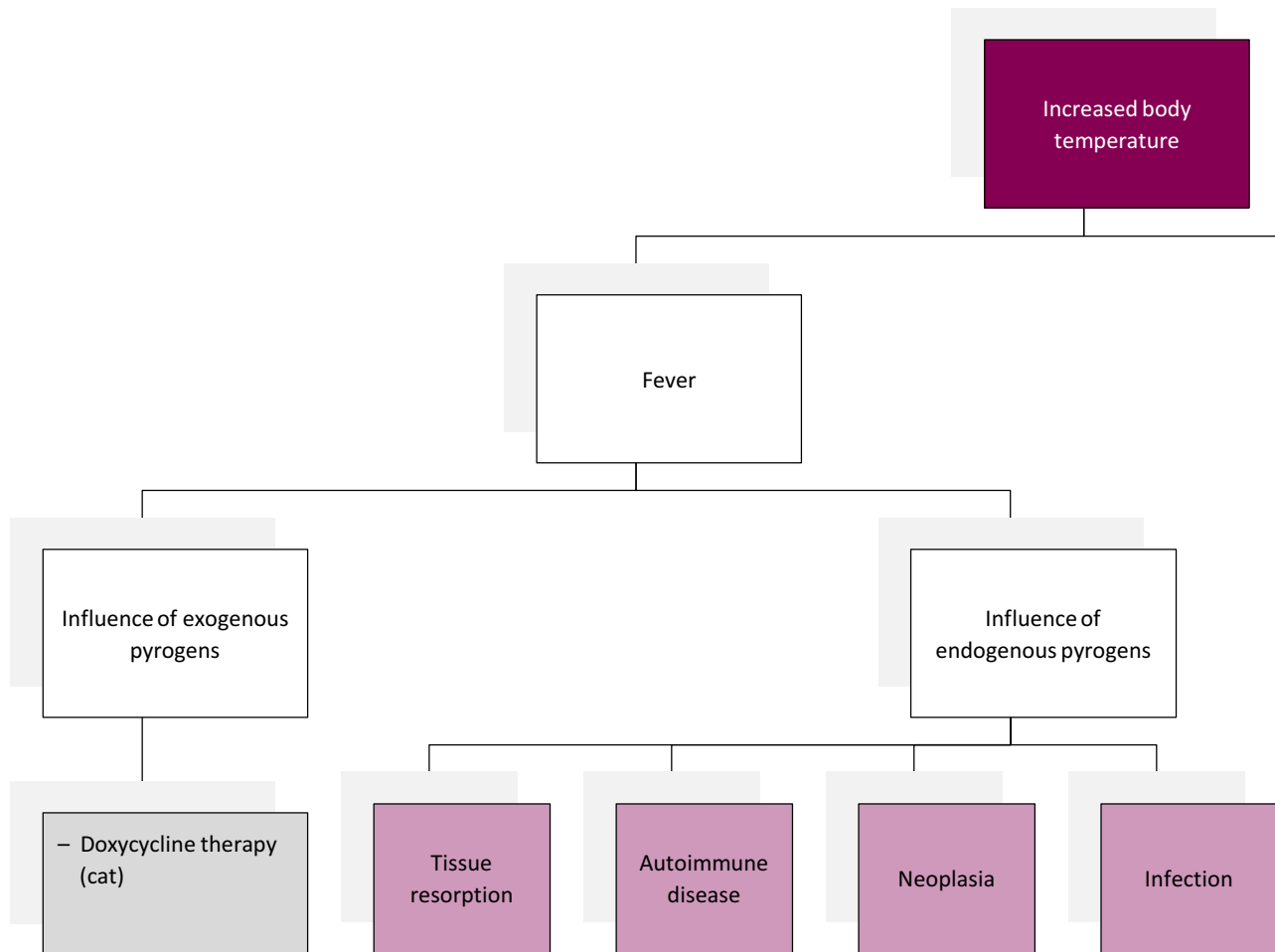
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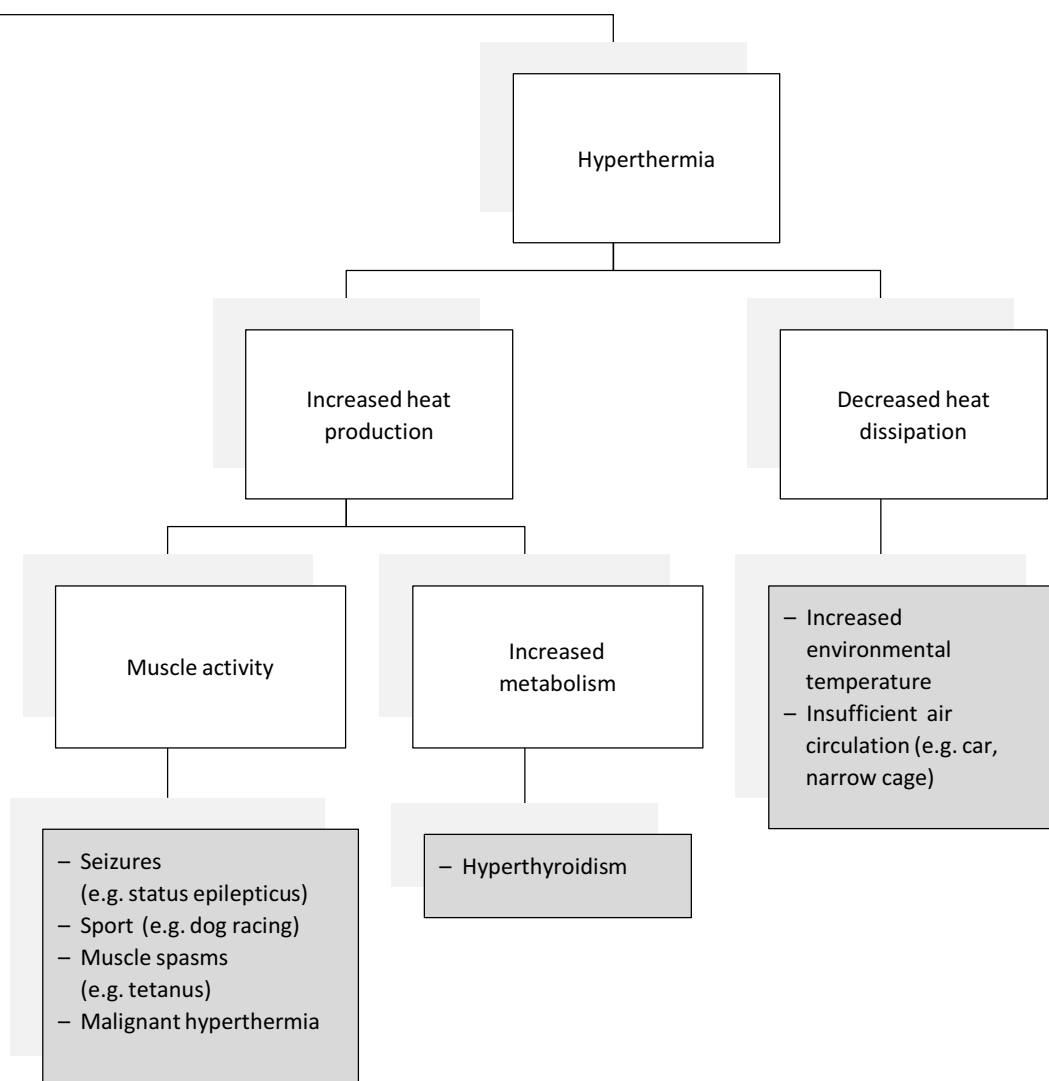
Internal medicine

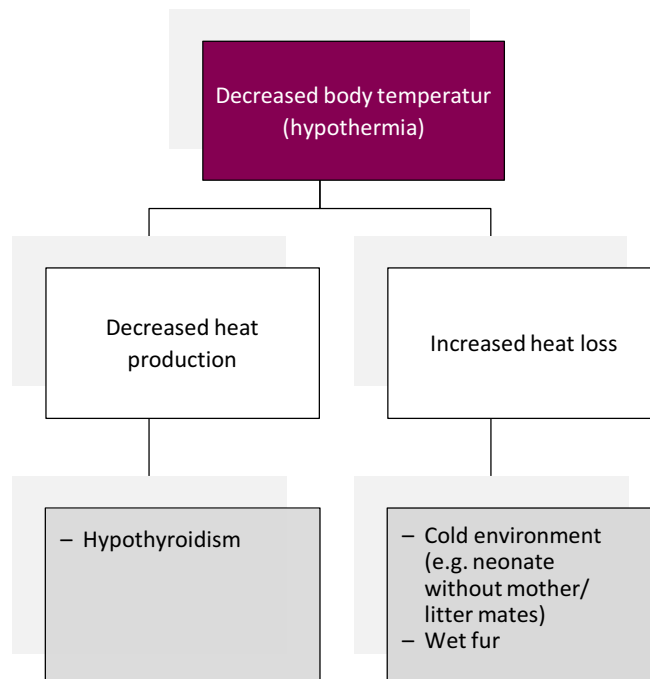


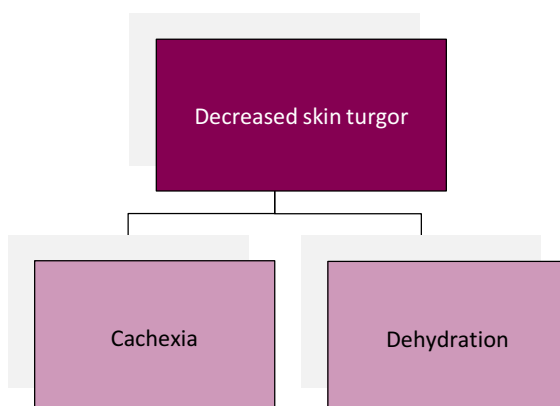


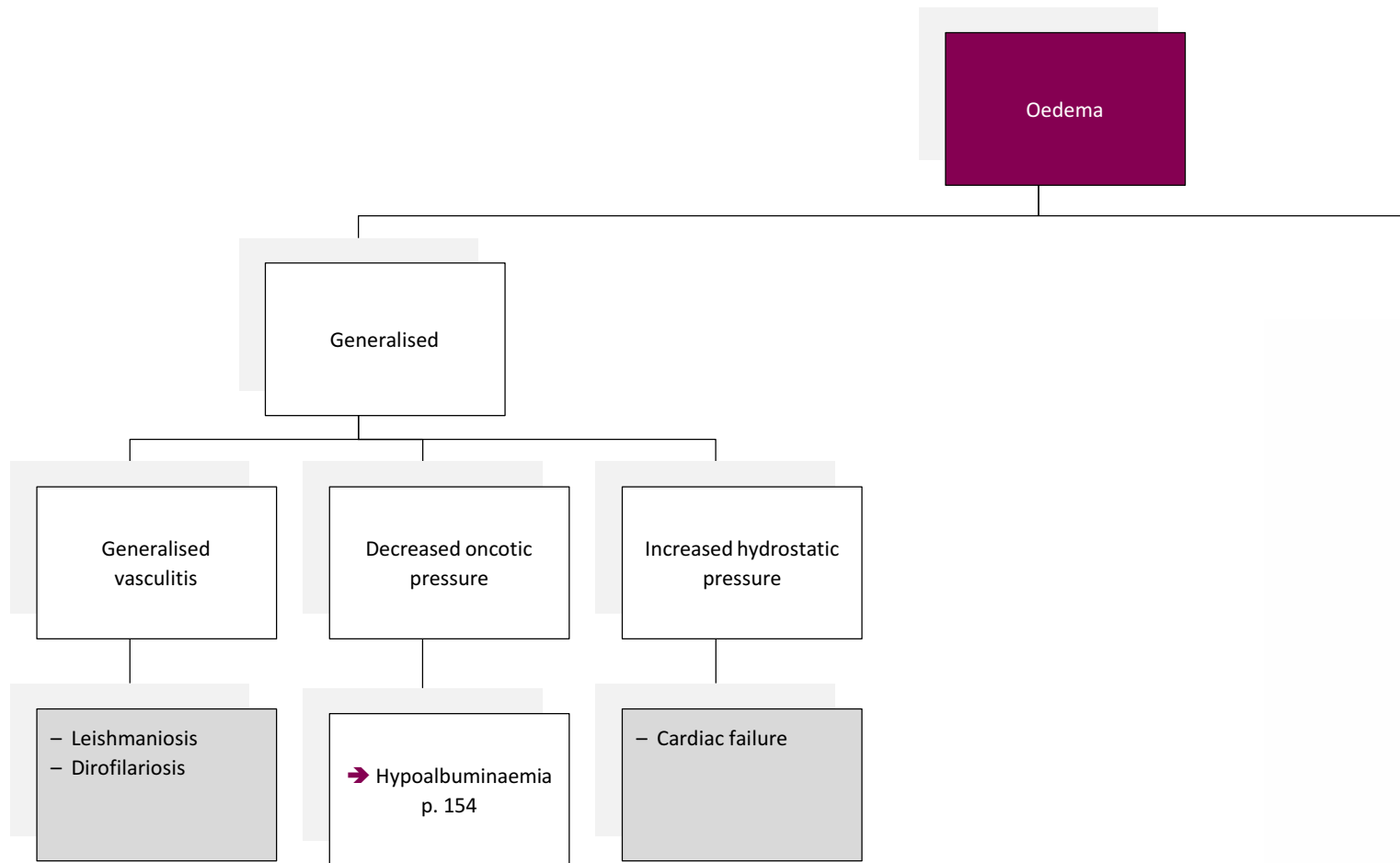


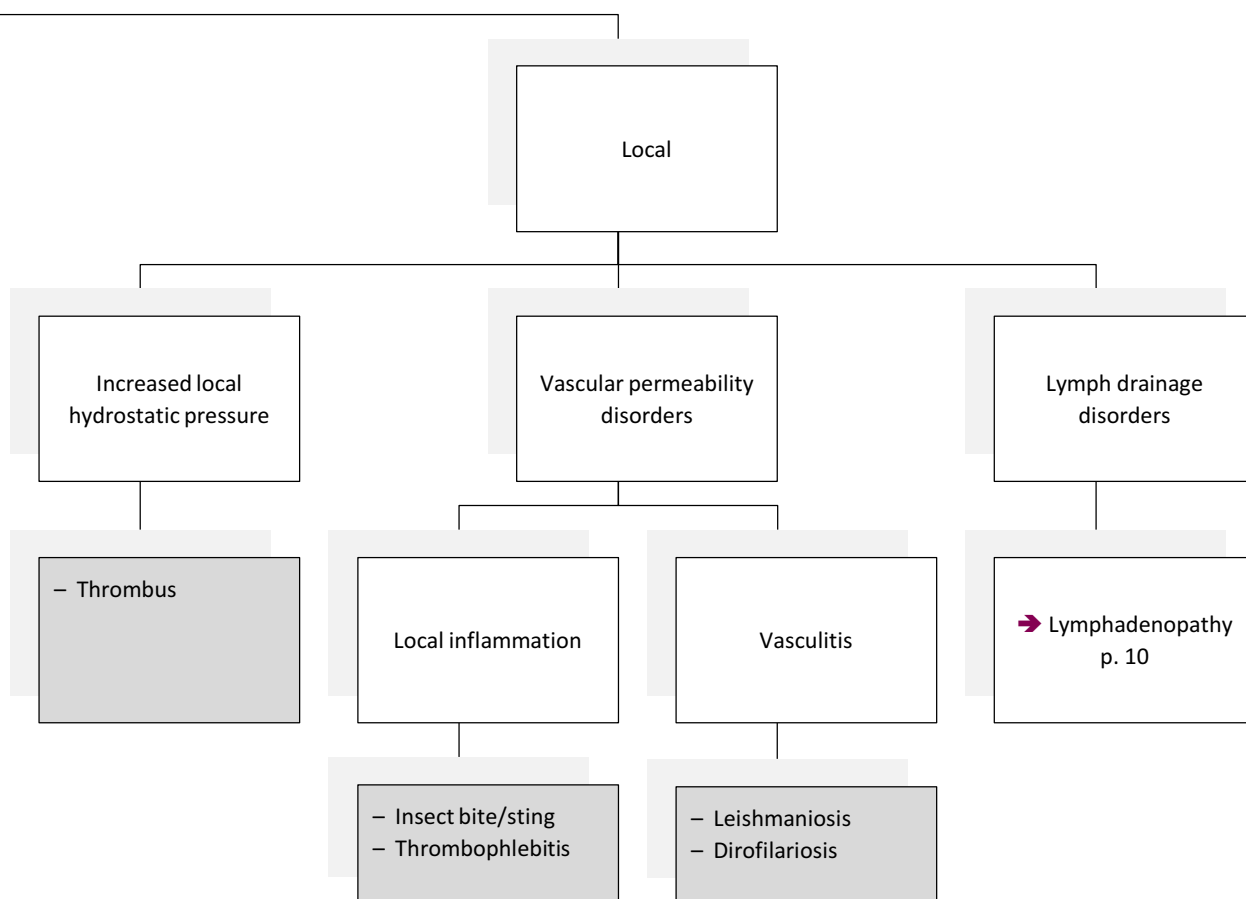


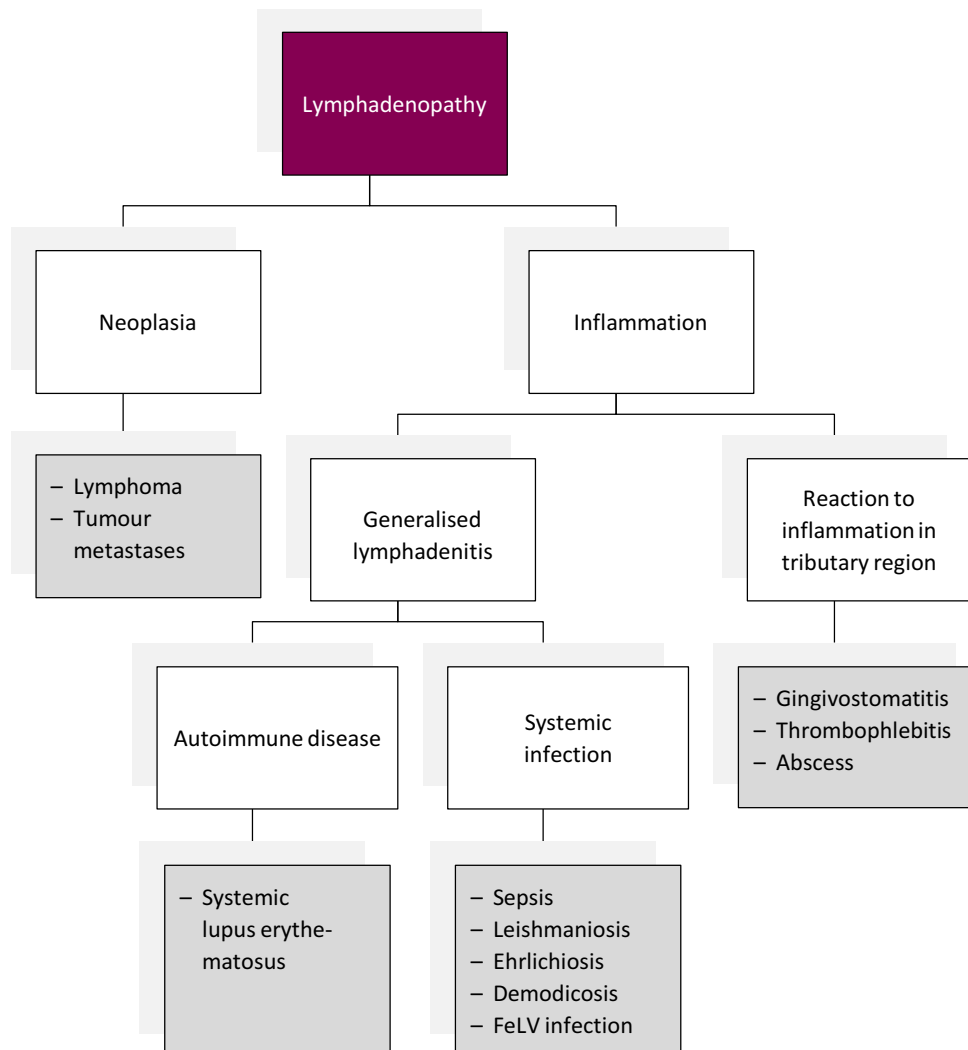


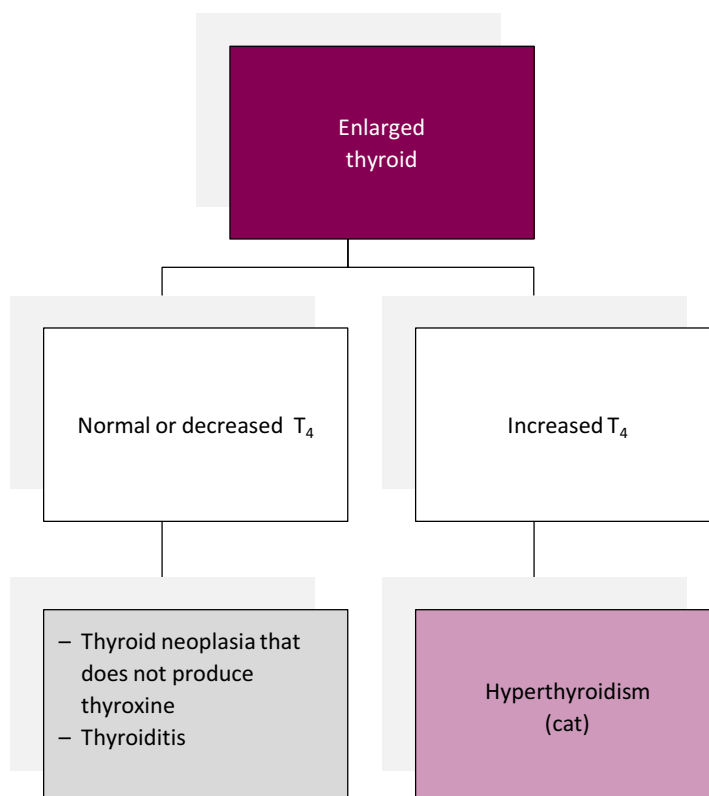


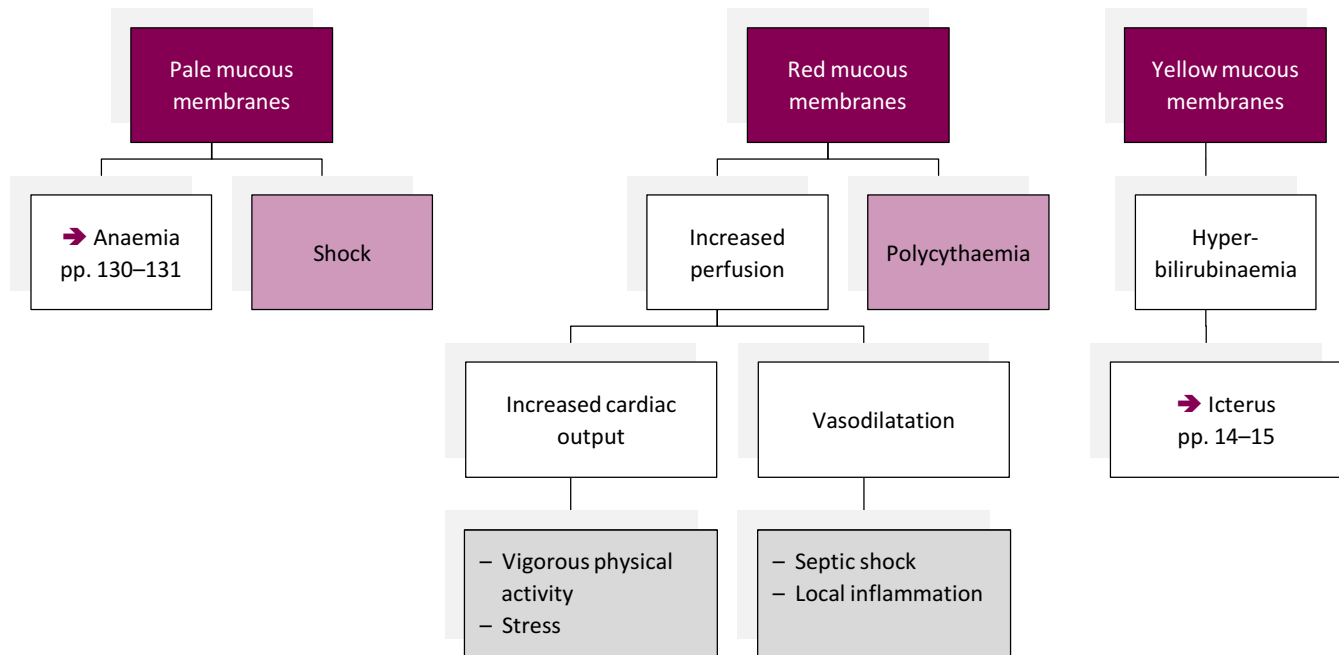


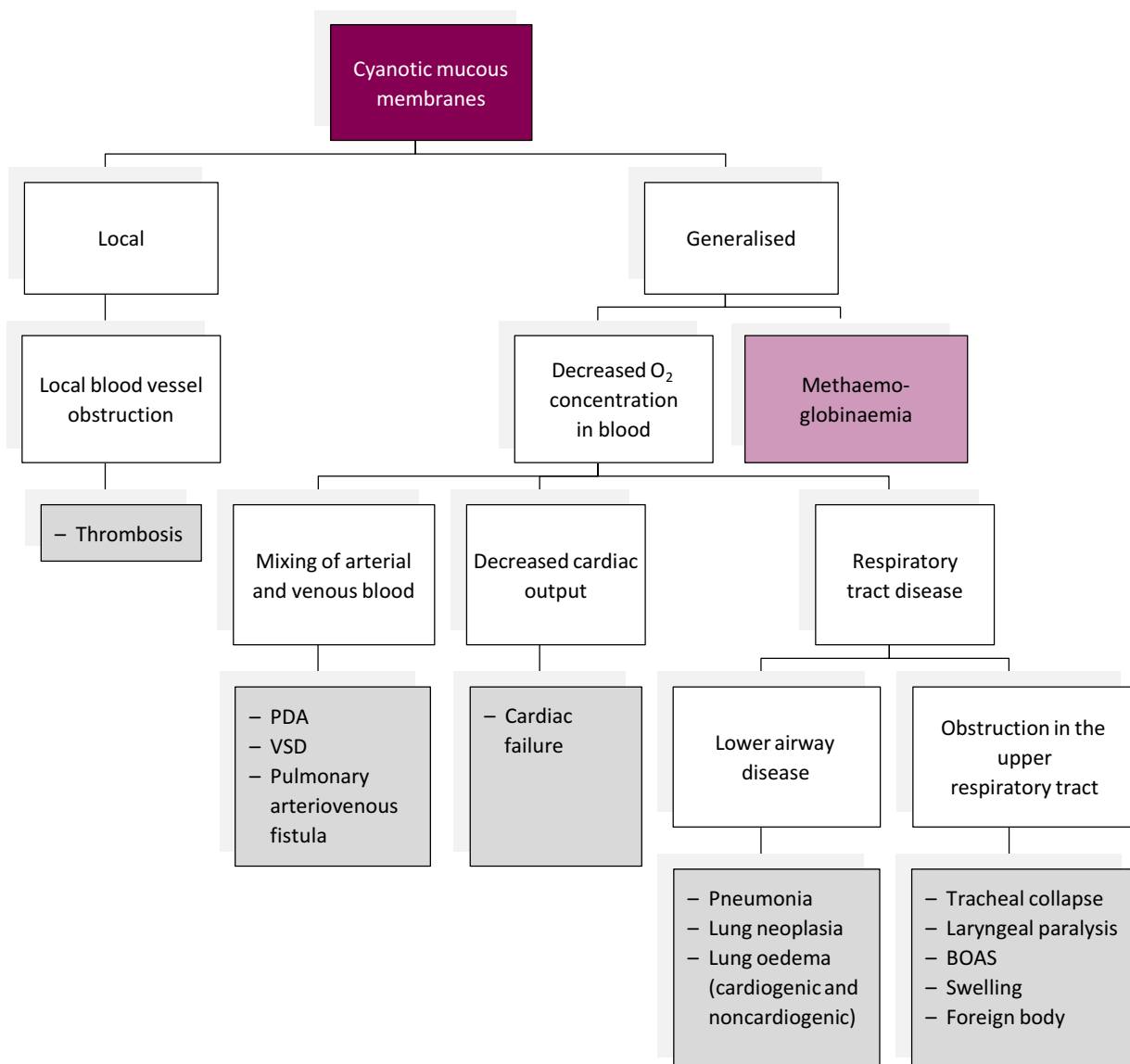


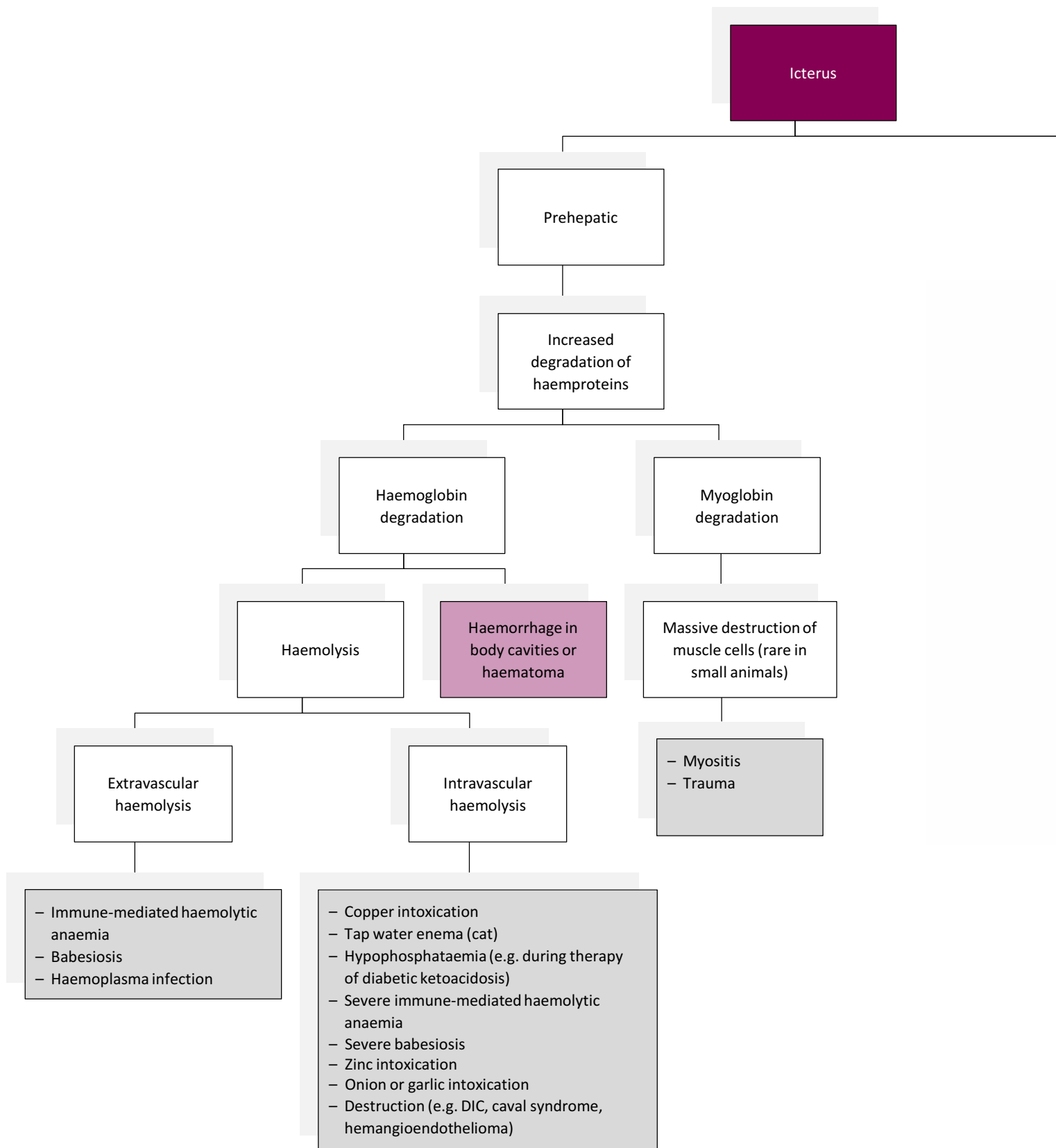


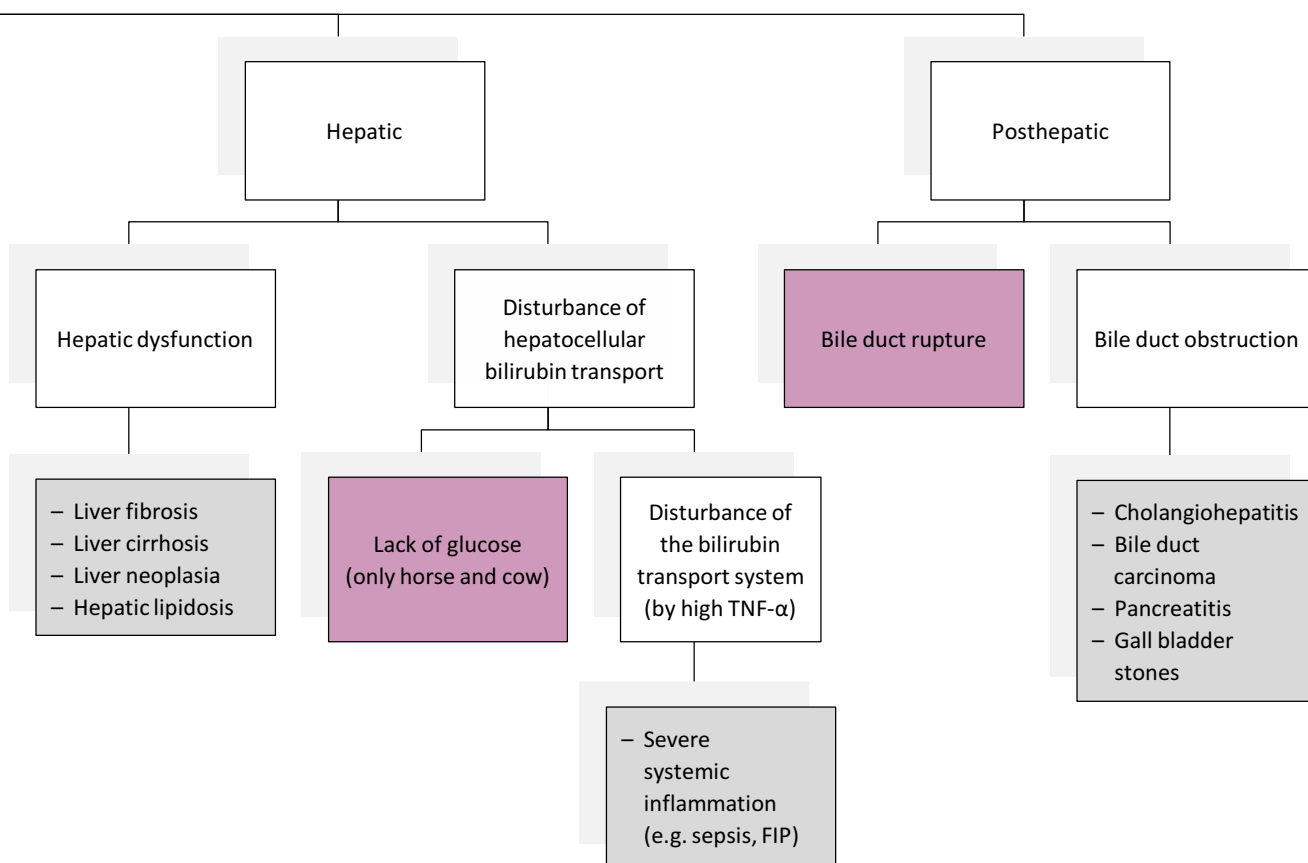


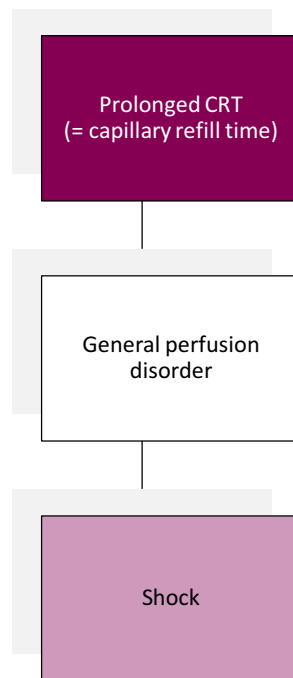


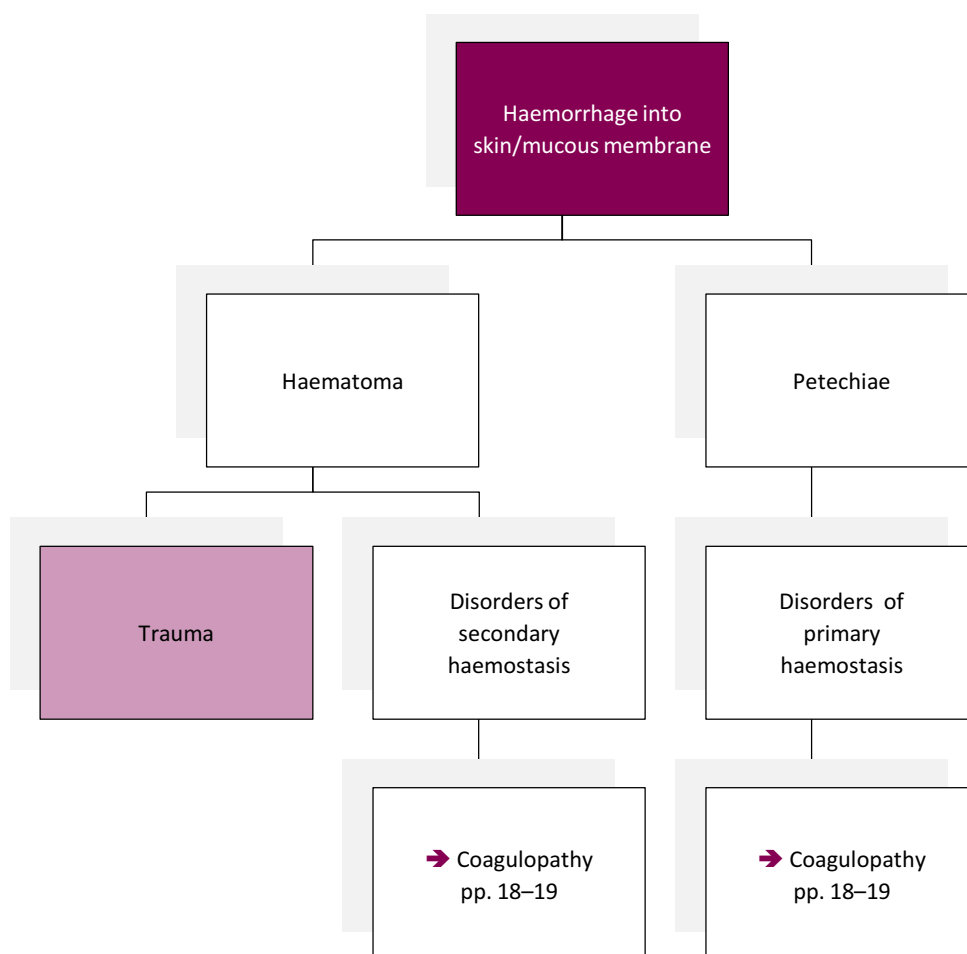


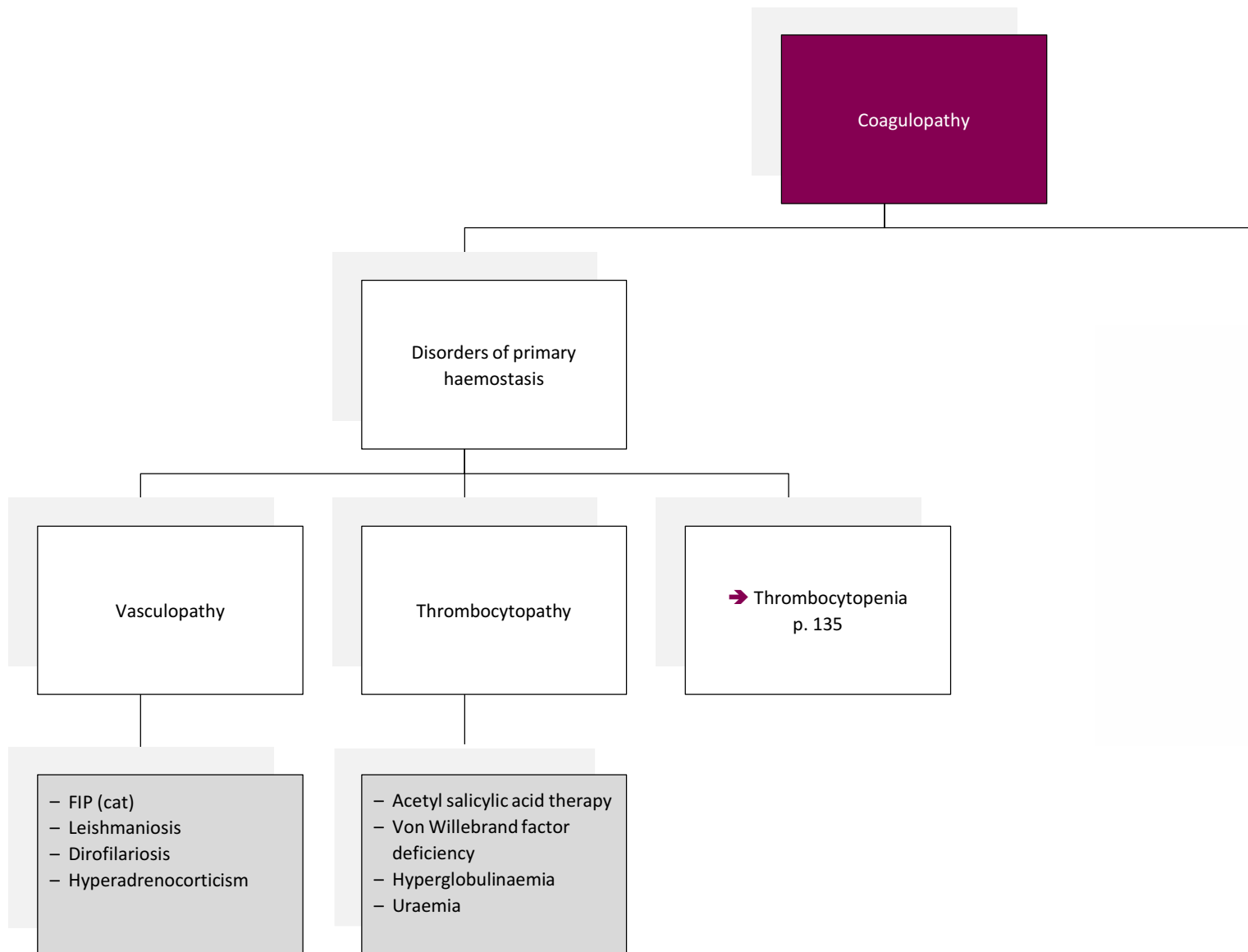


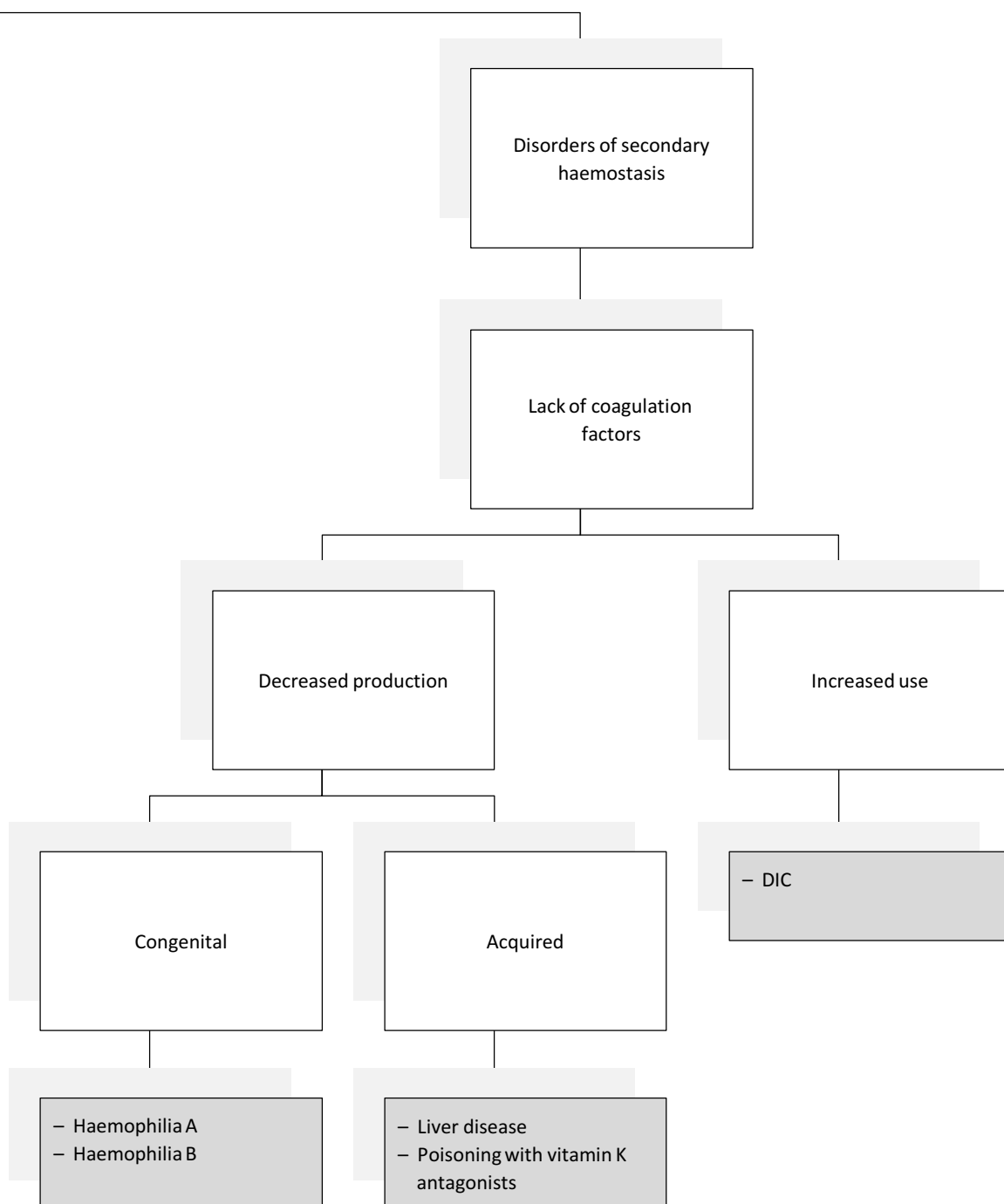


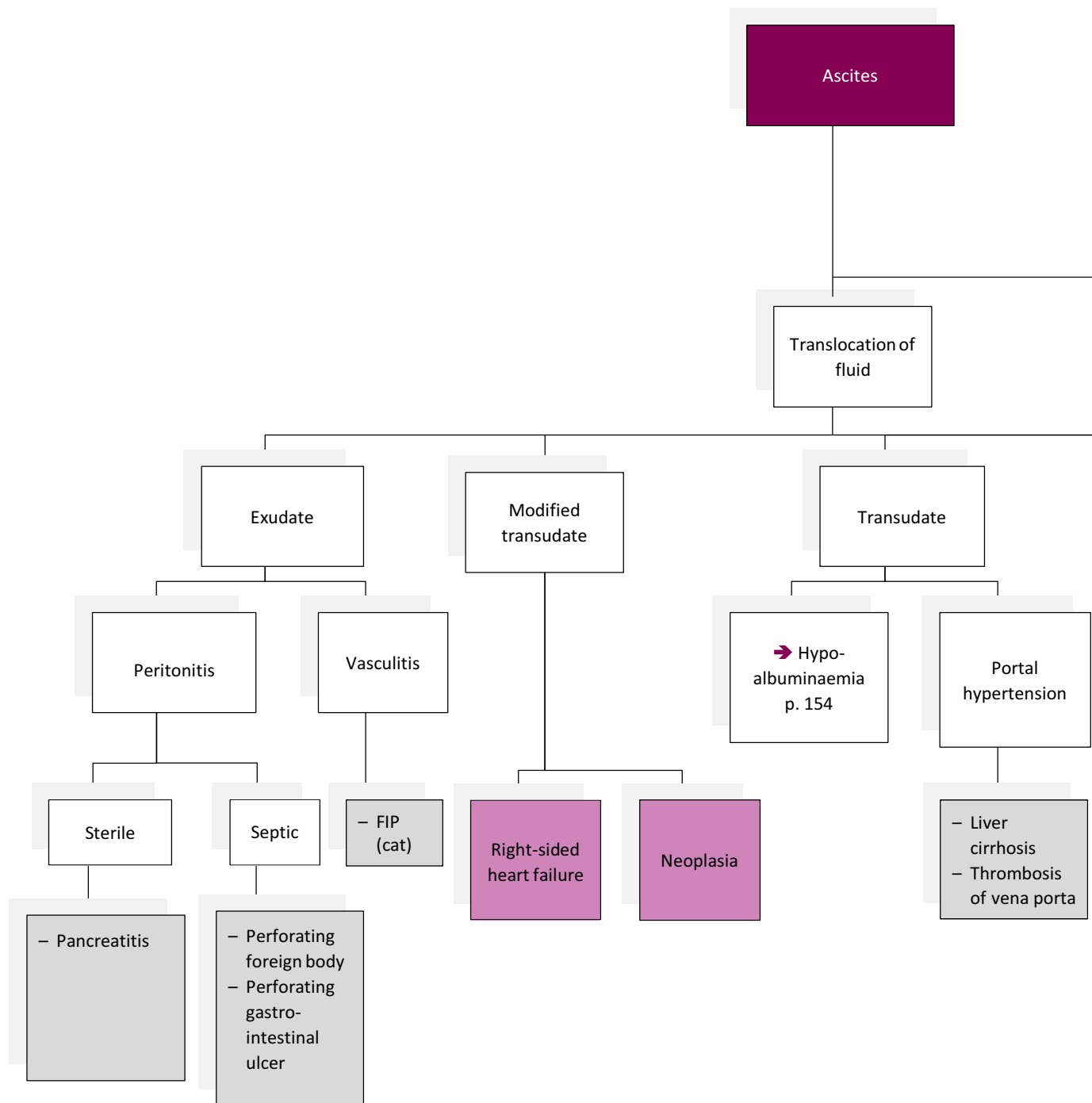


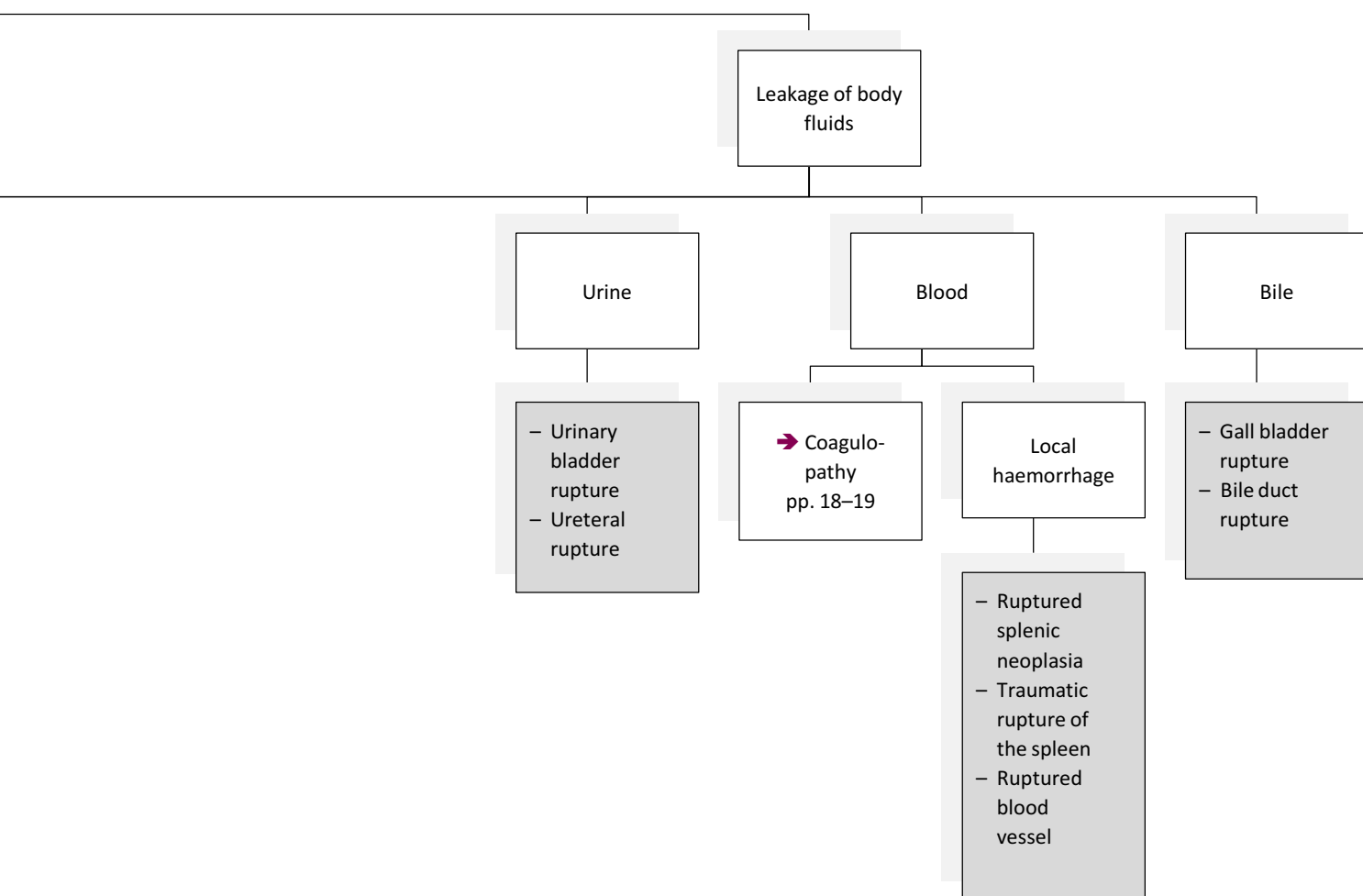


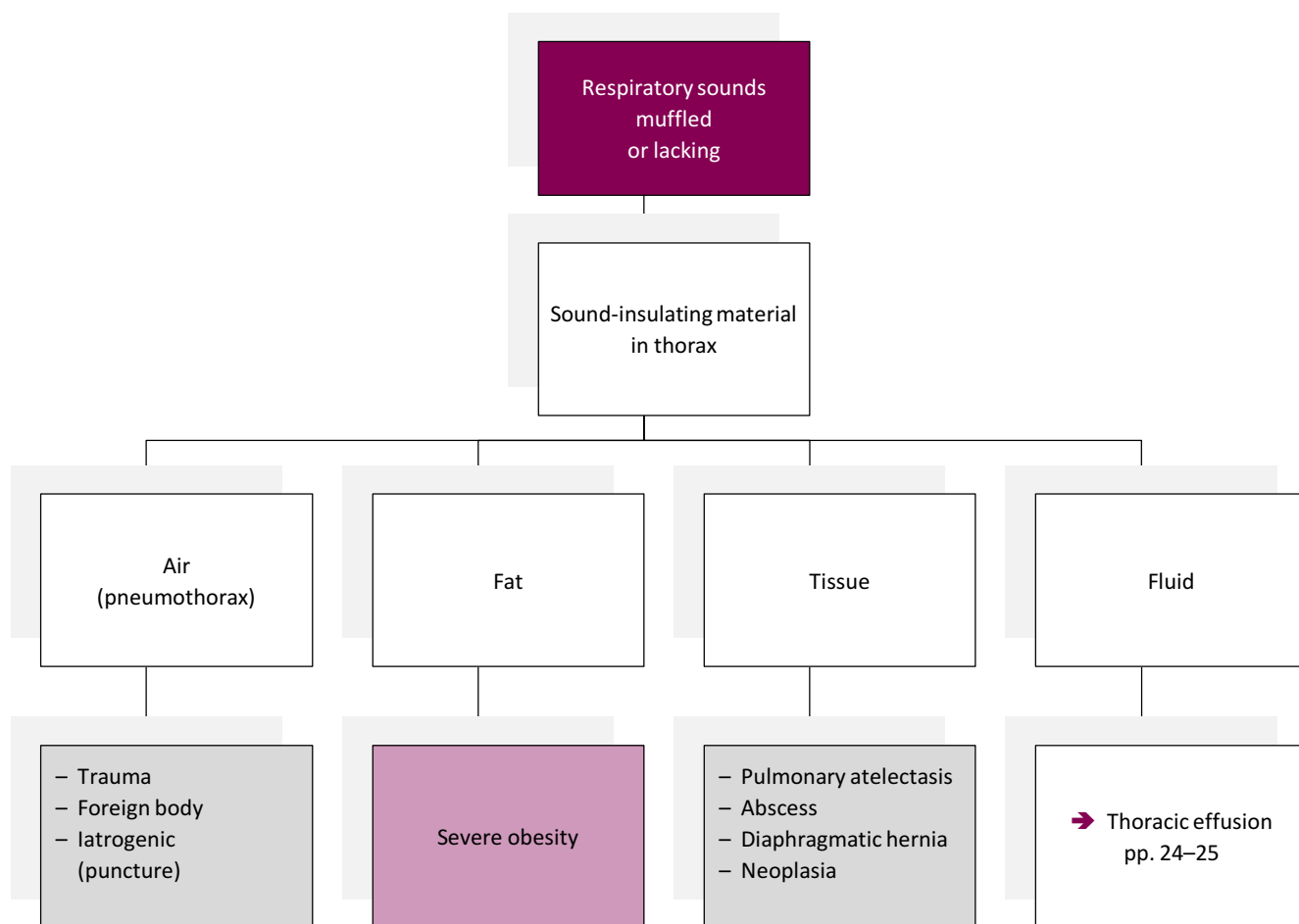


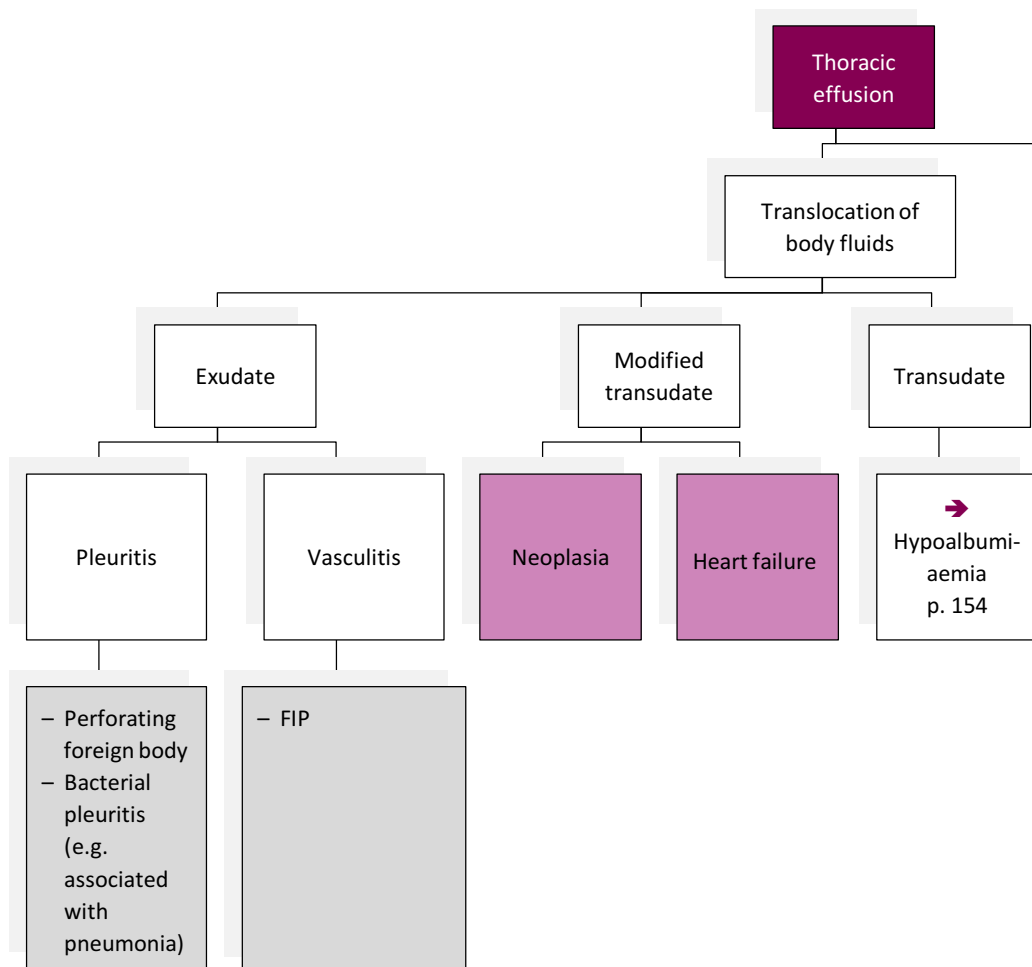


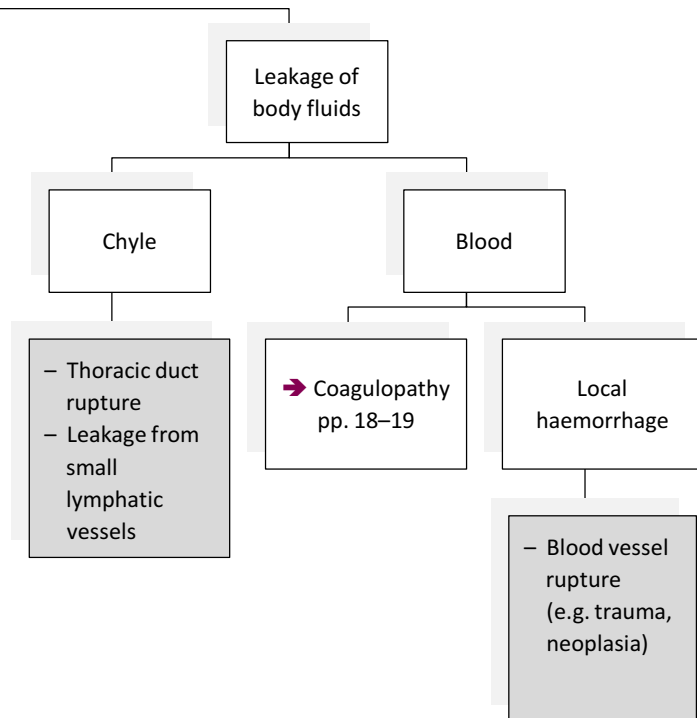


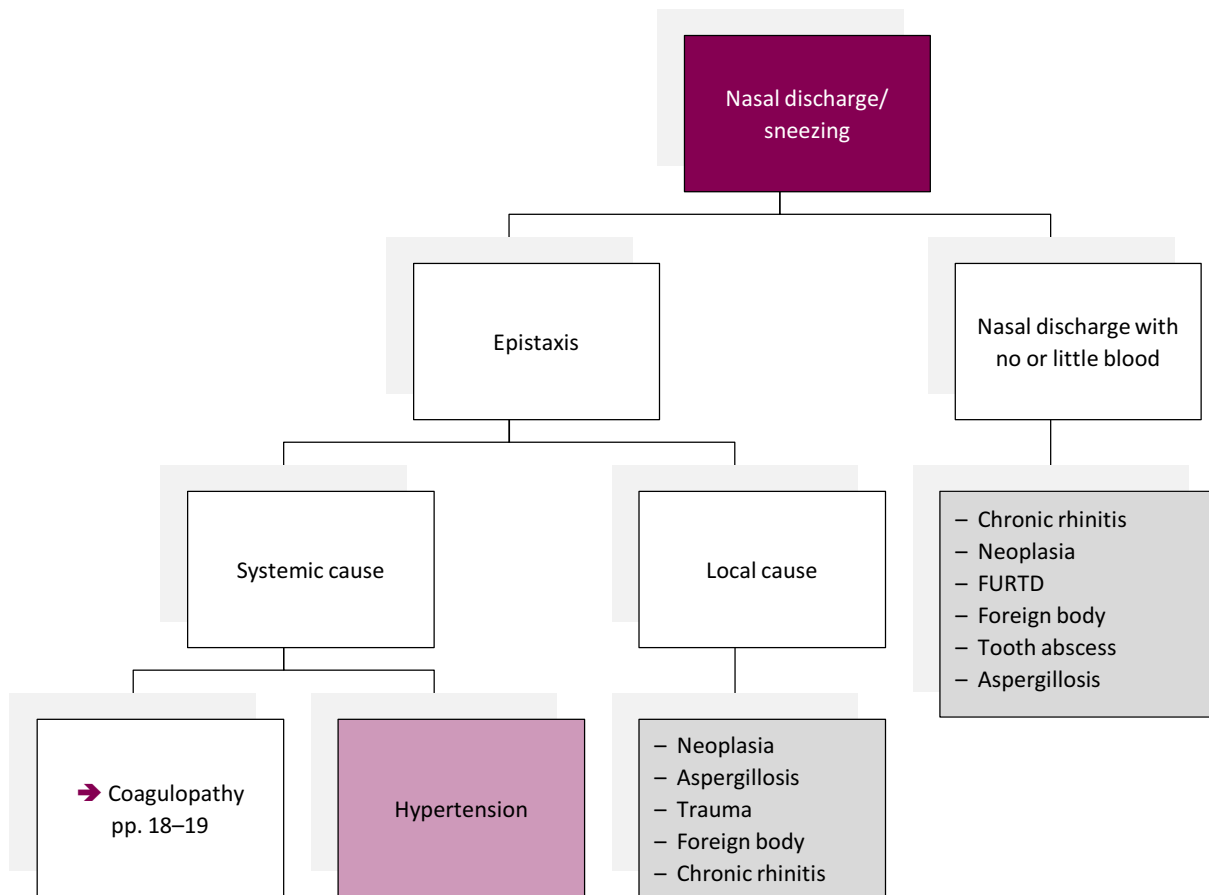


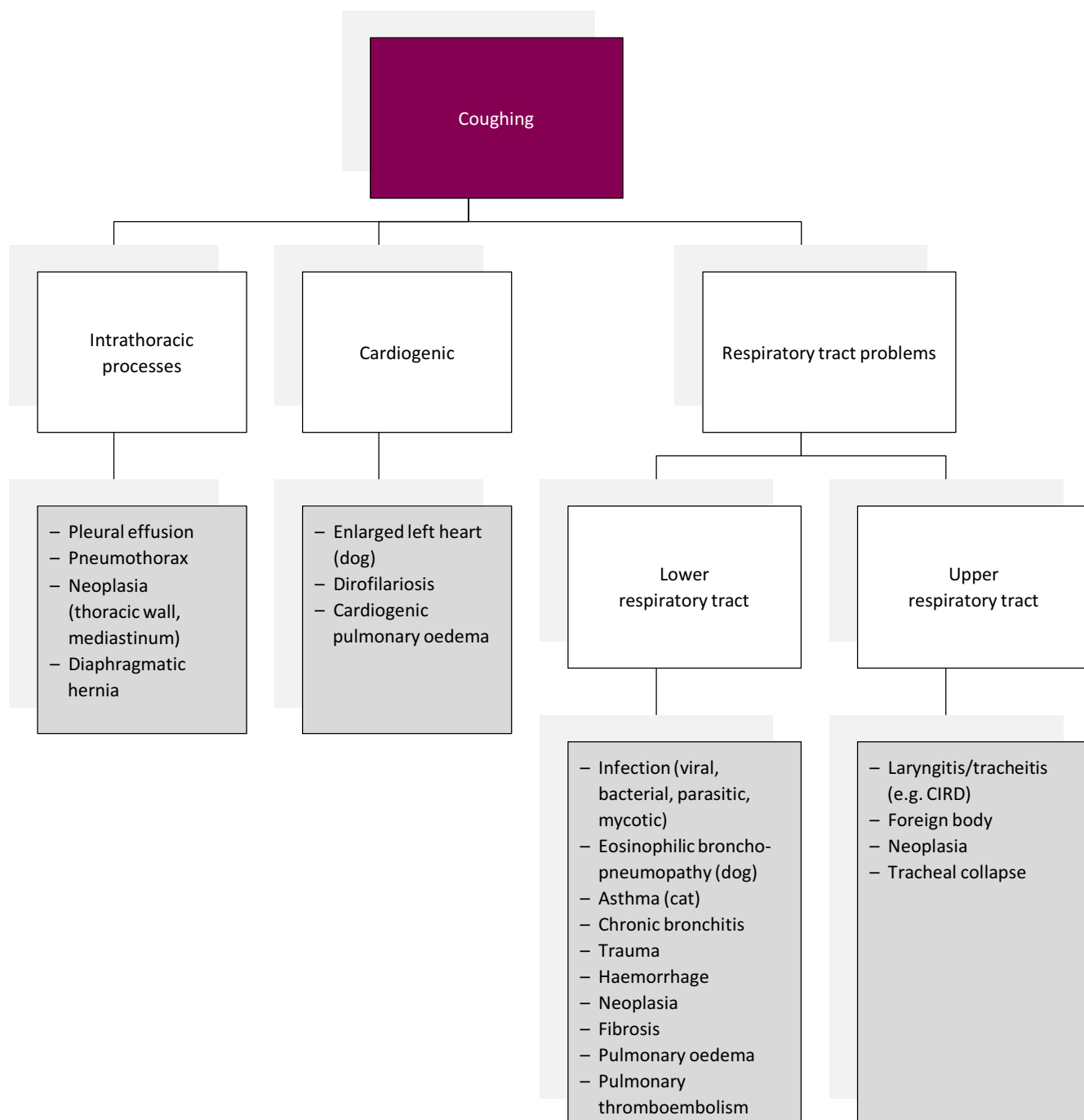


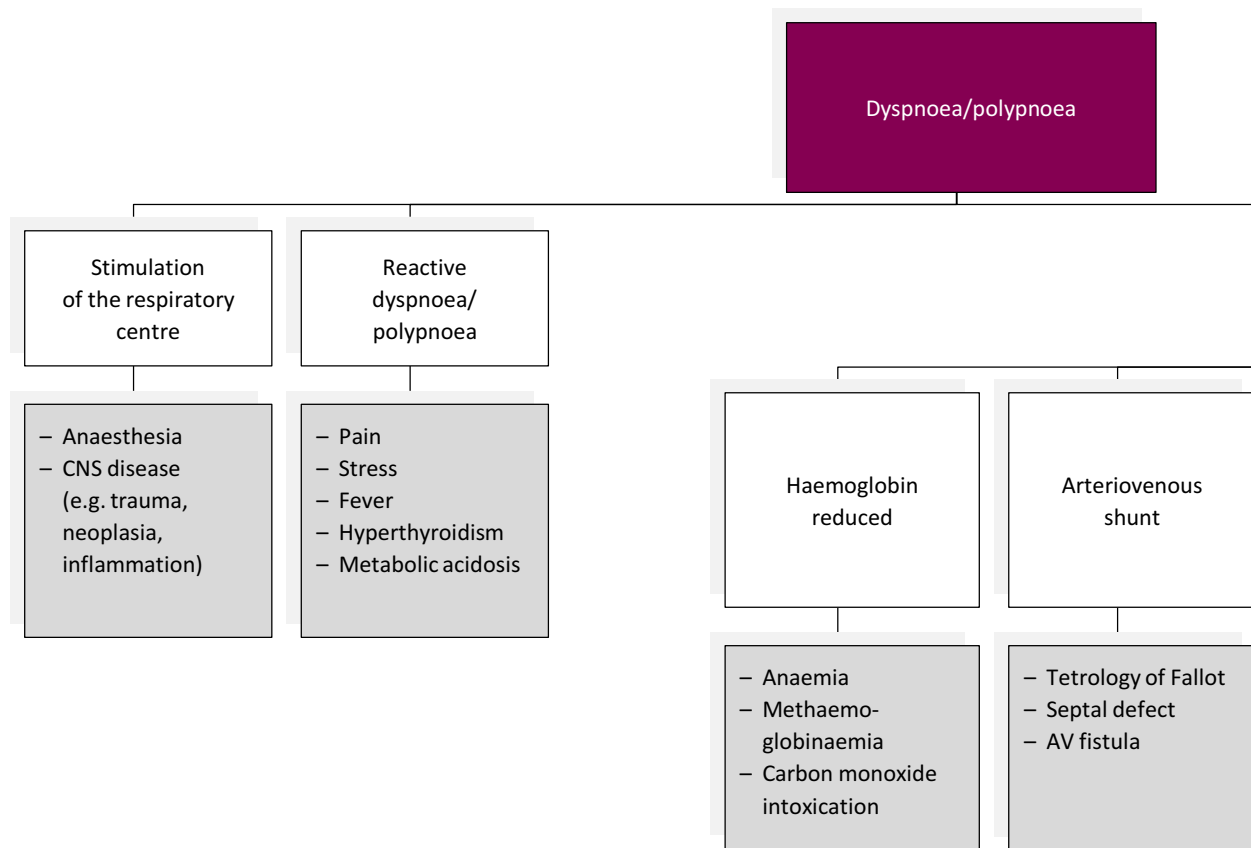


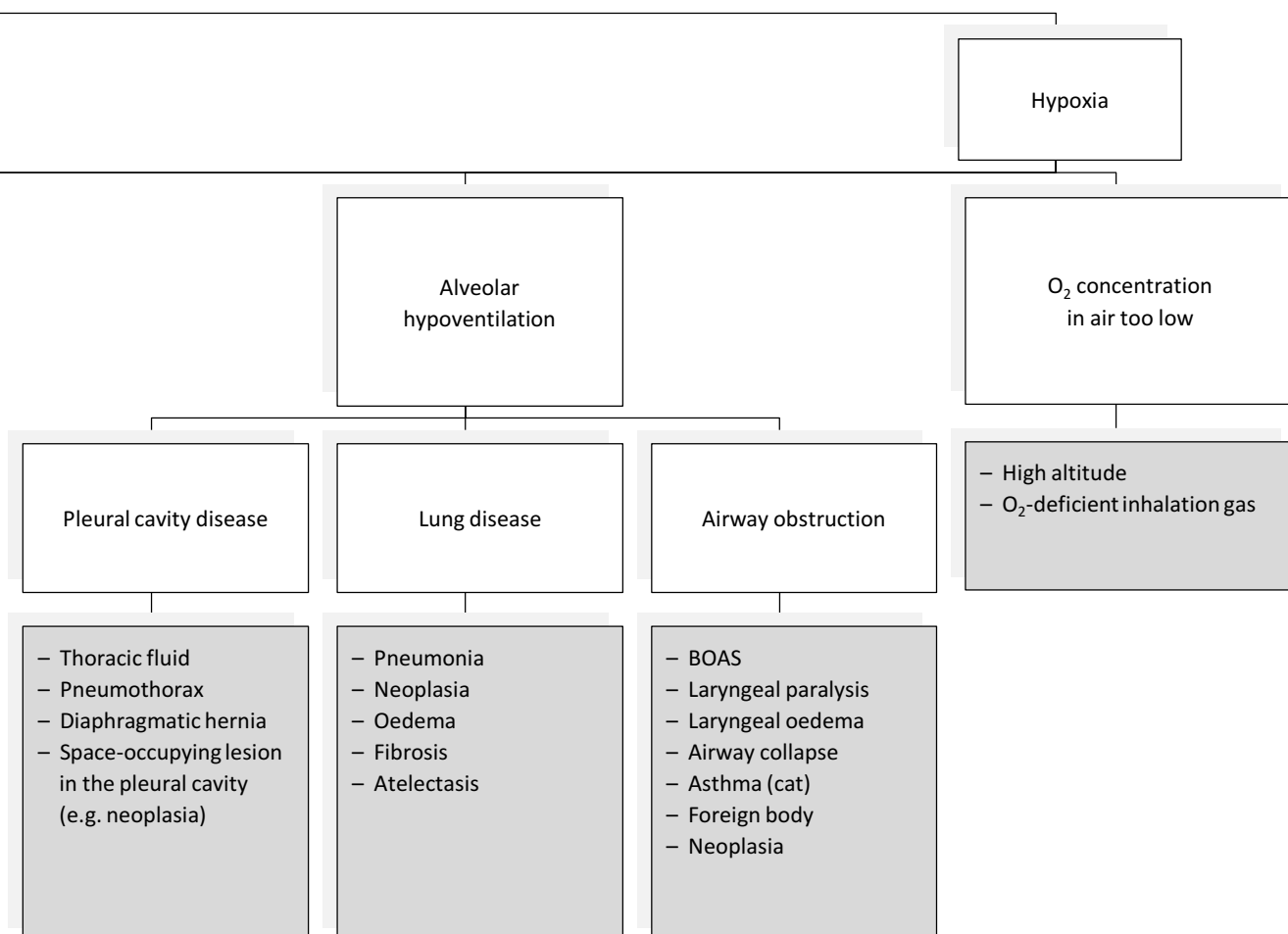


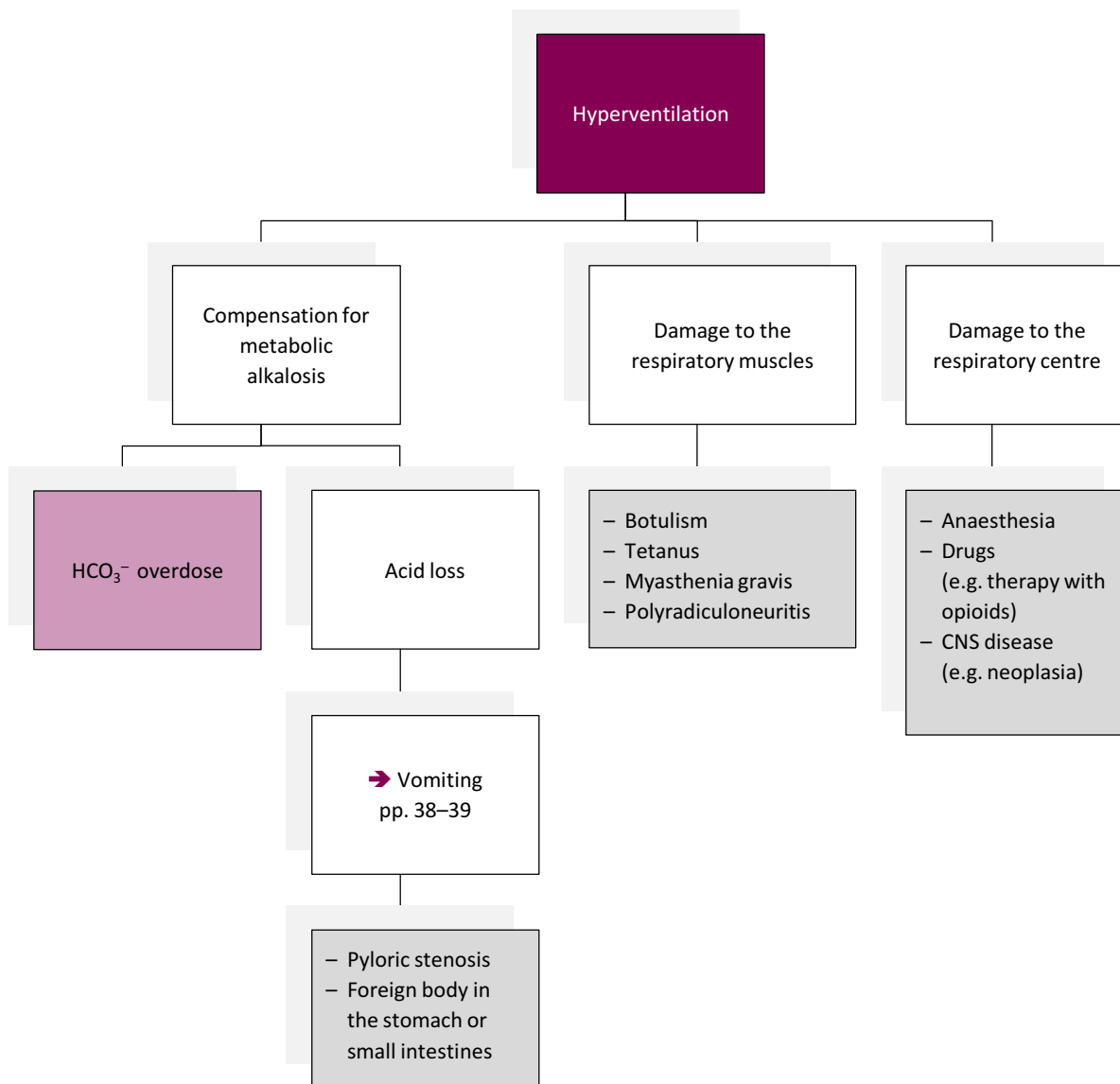


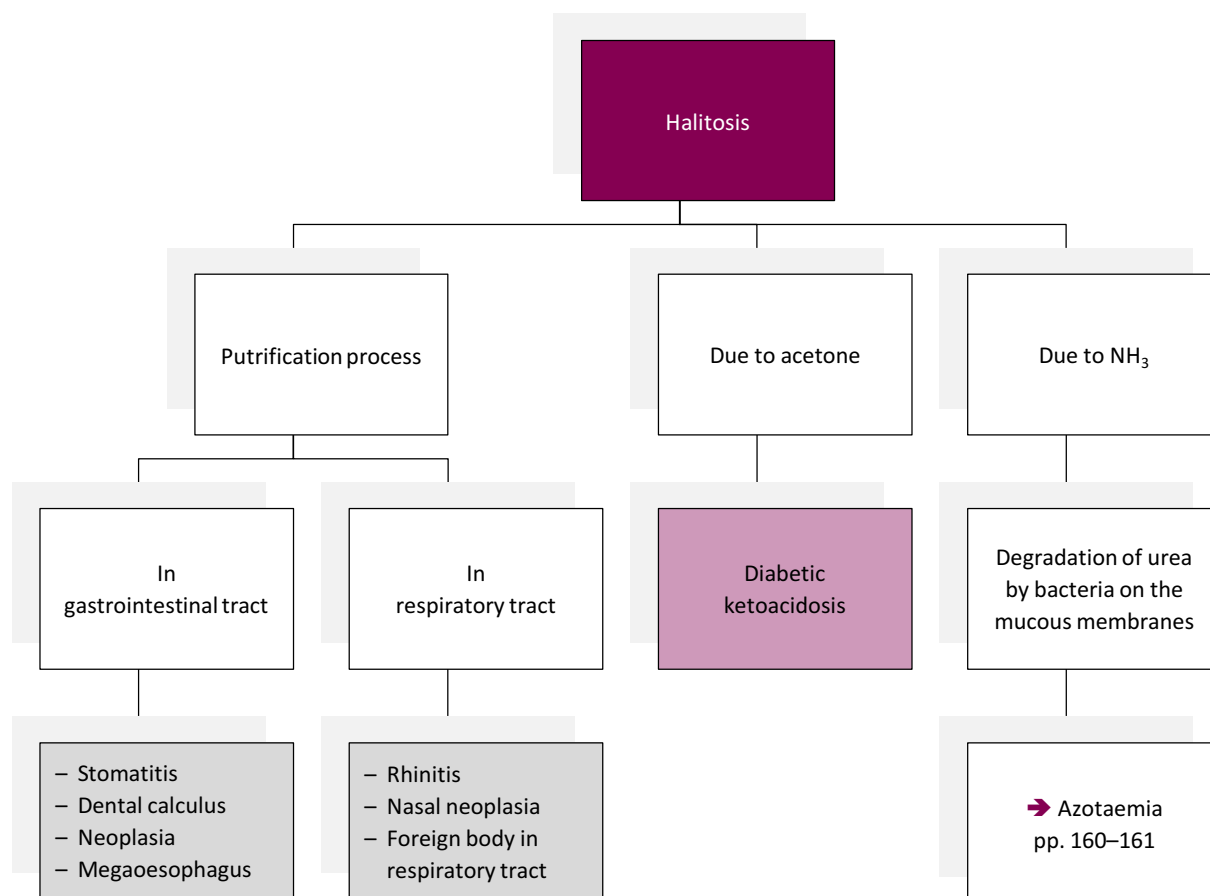


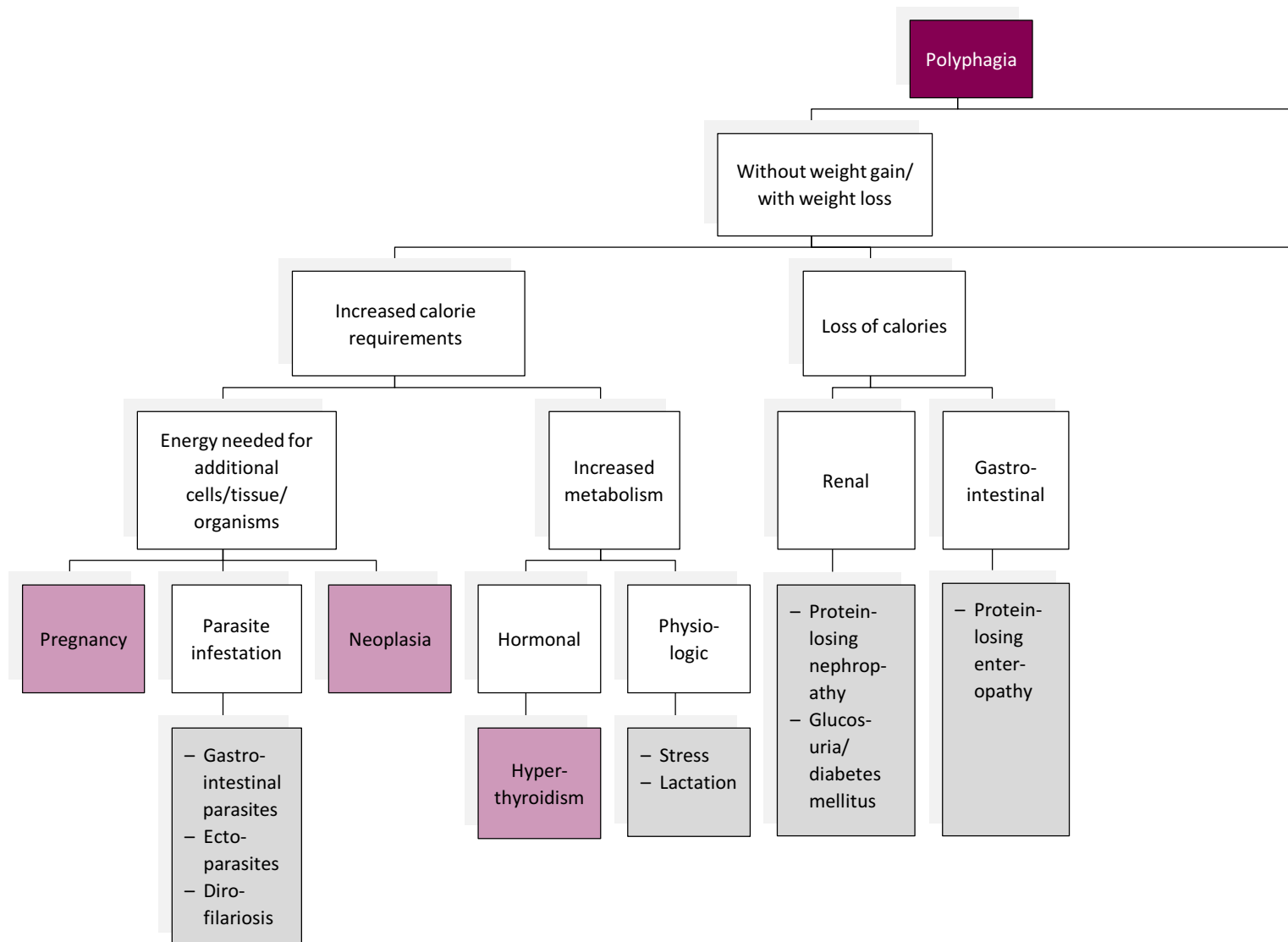


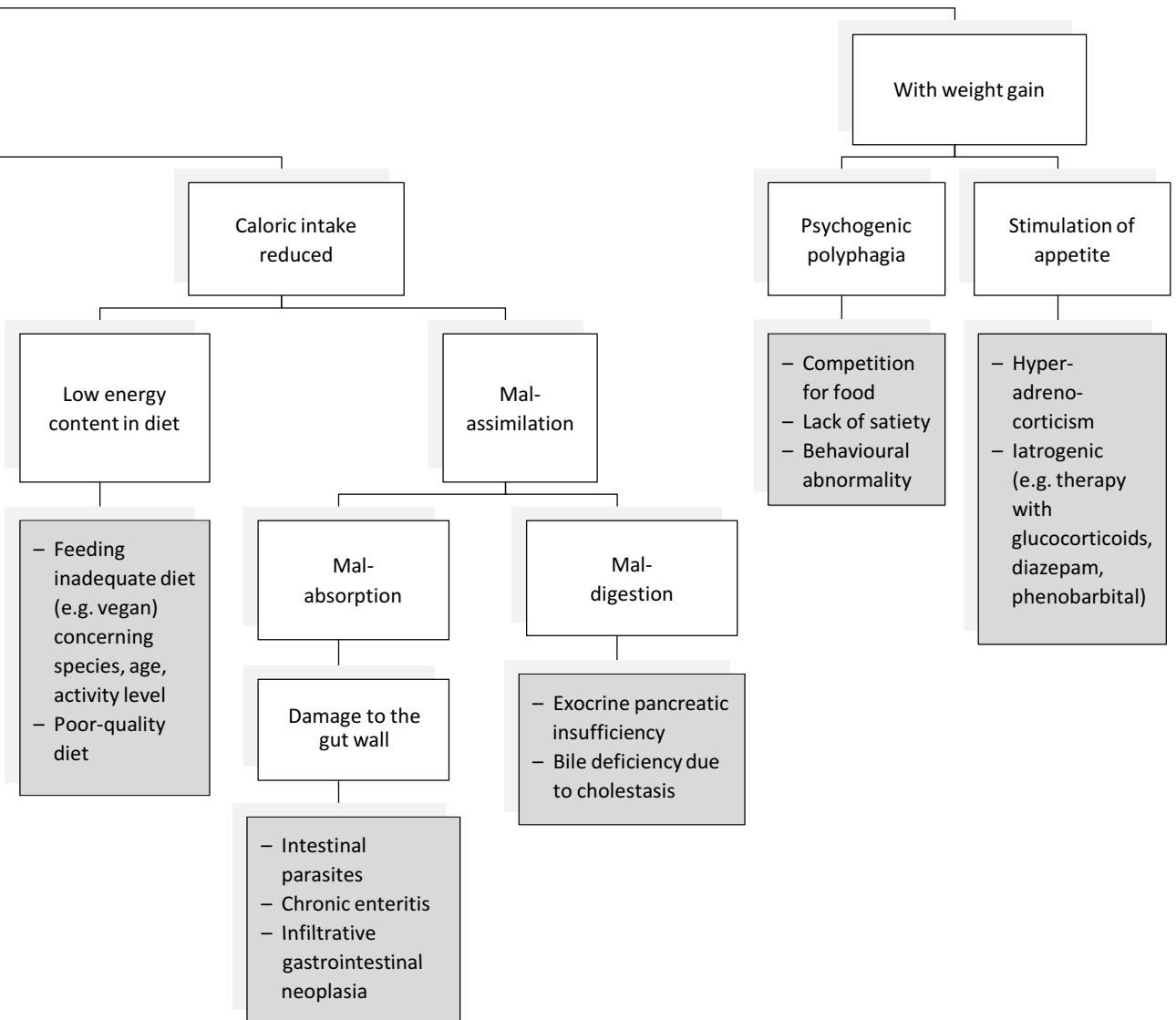


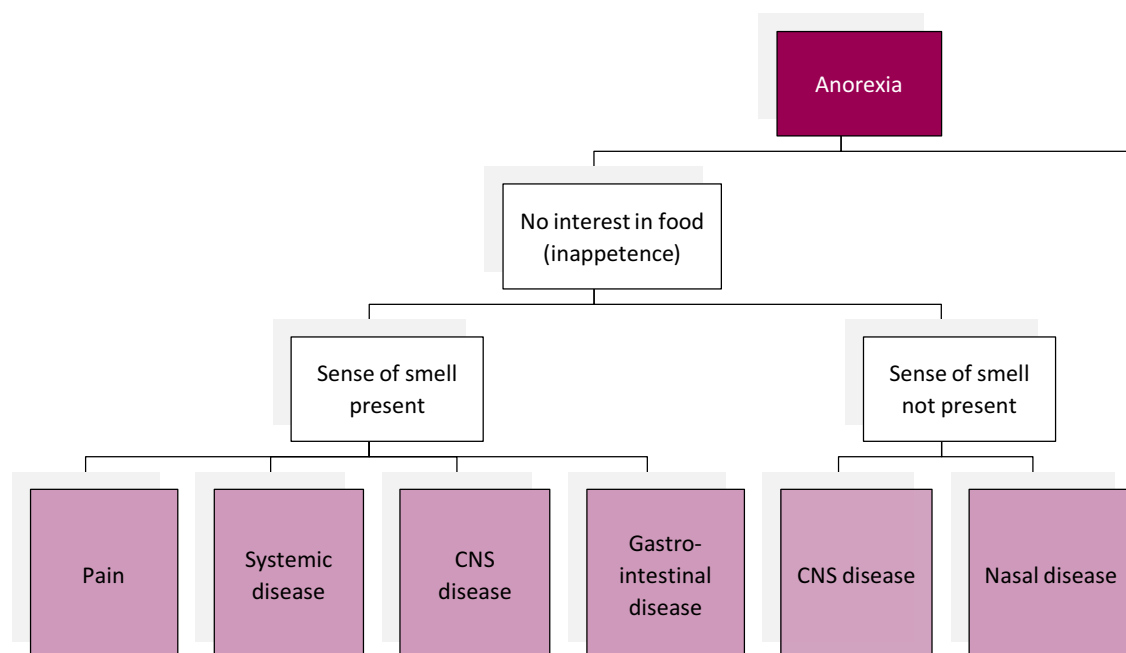


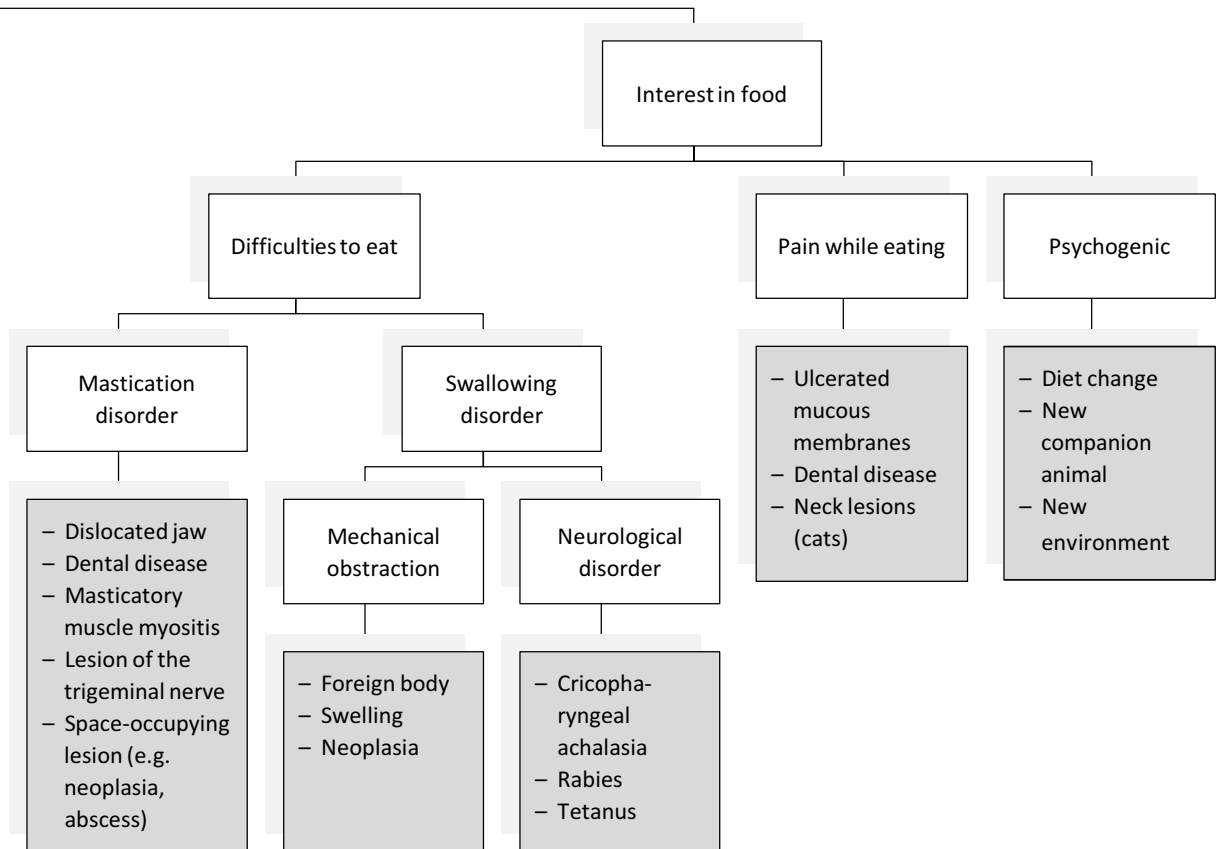




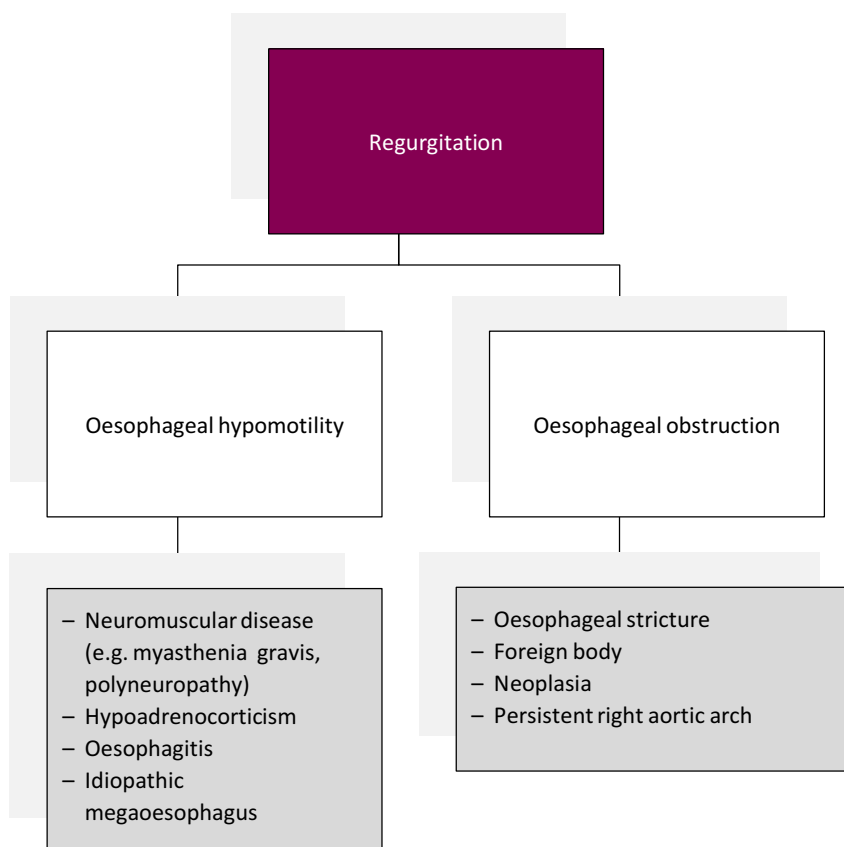


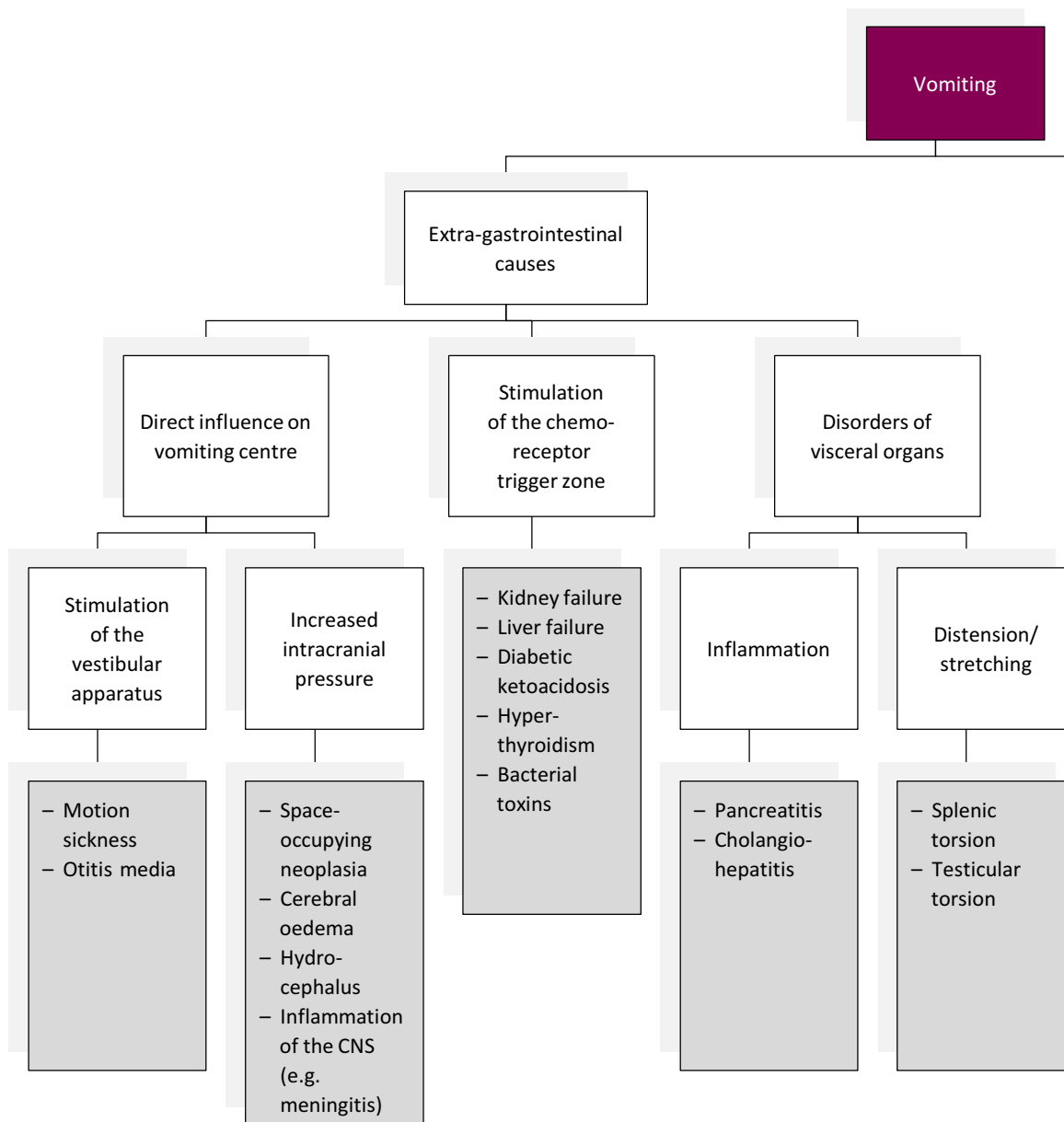


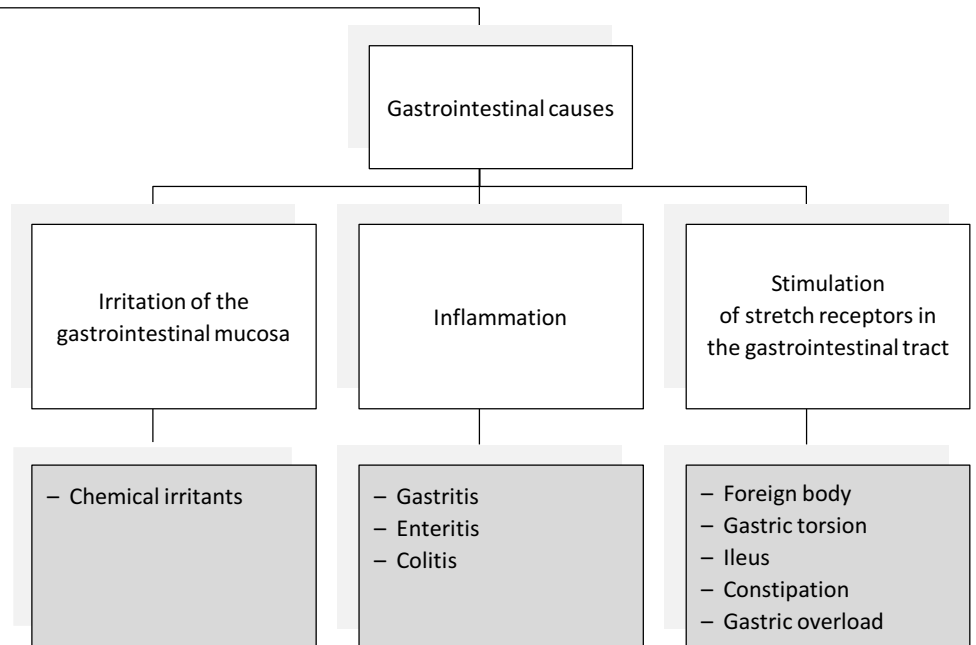


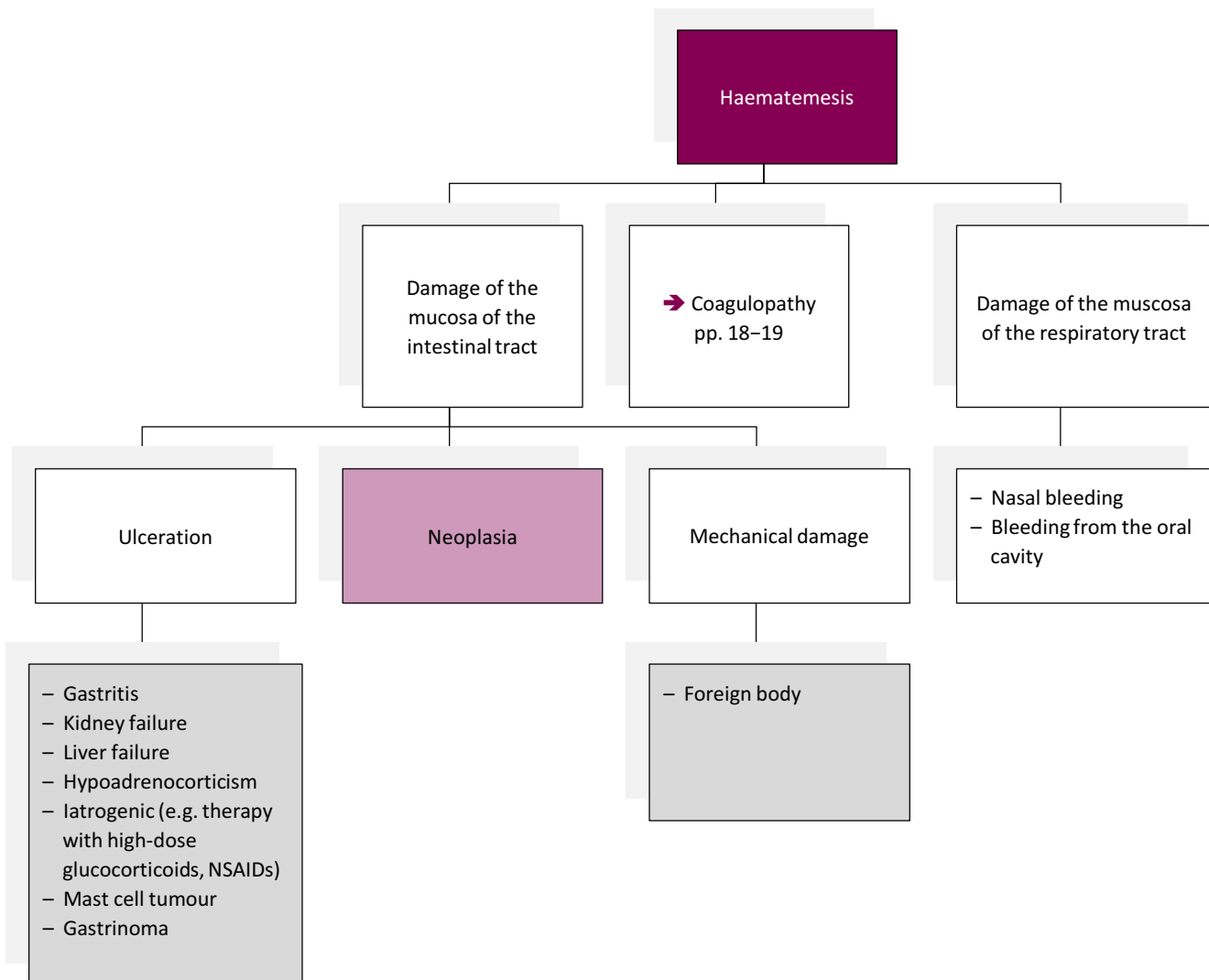


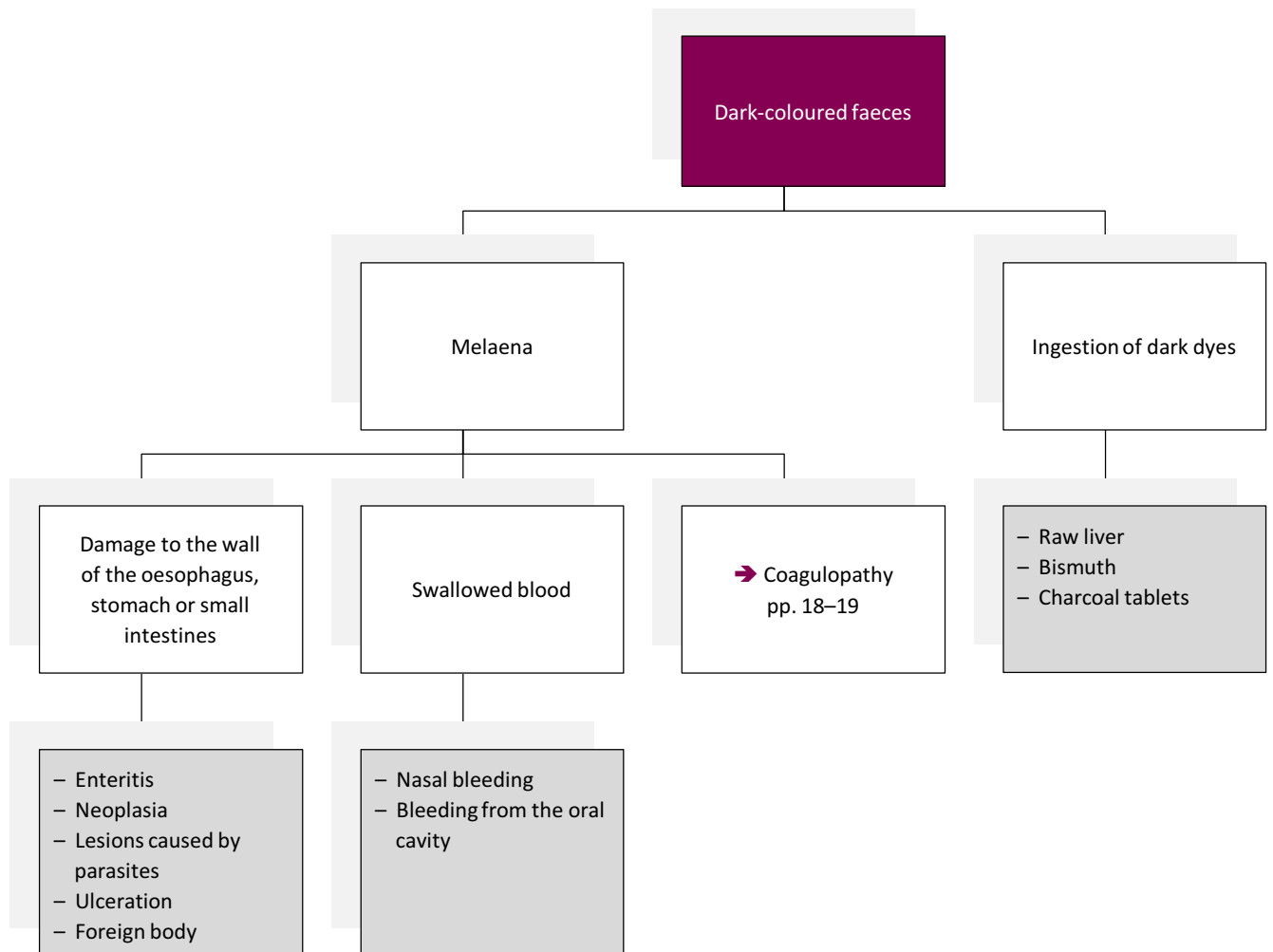


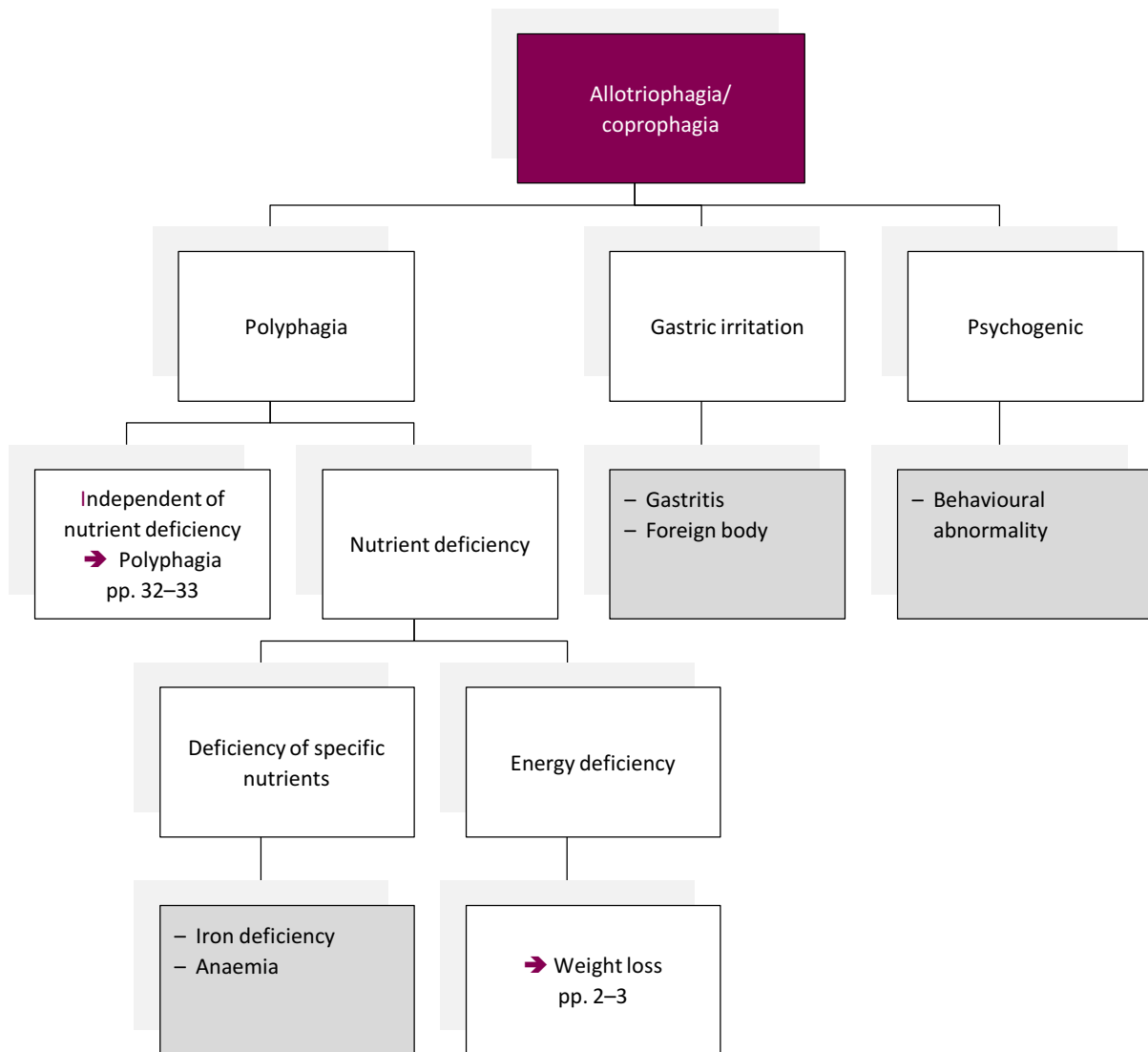


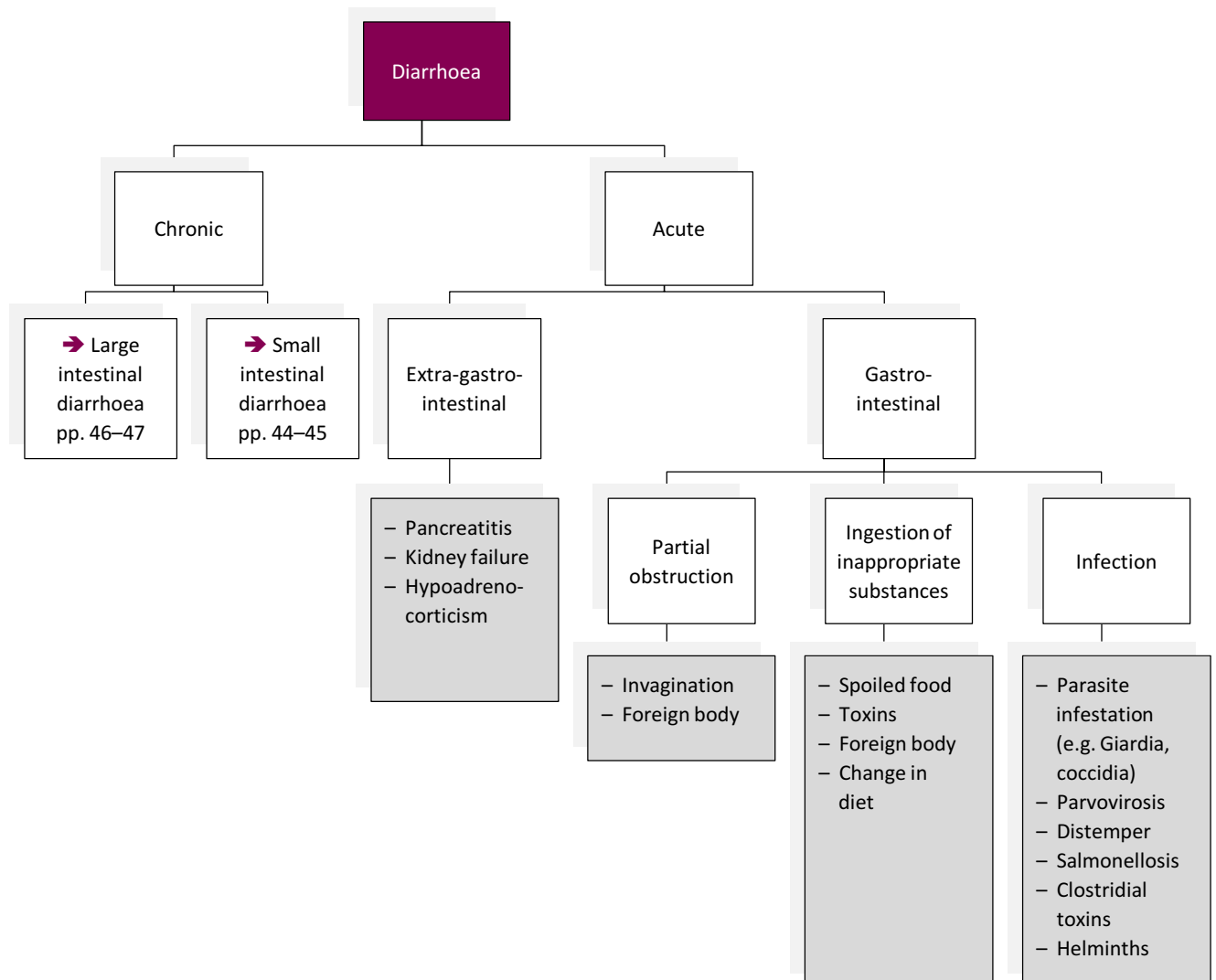


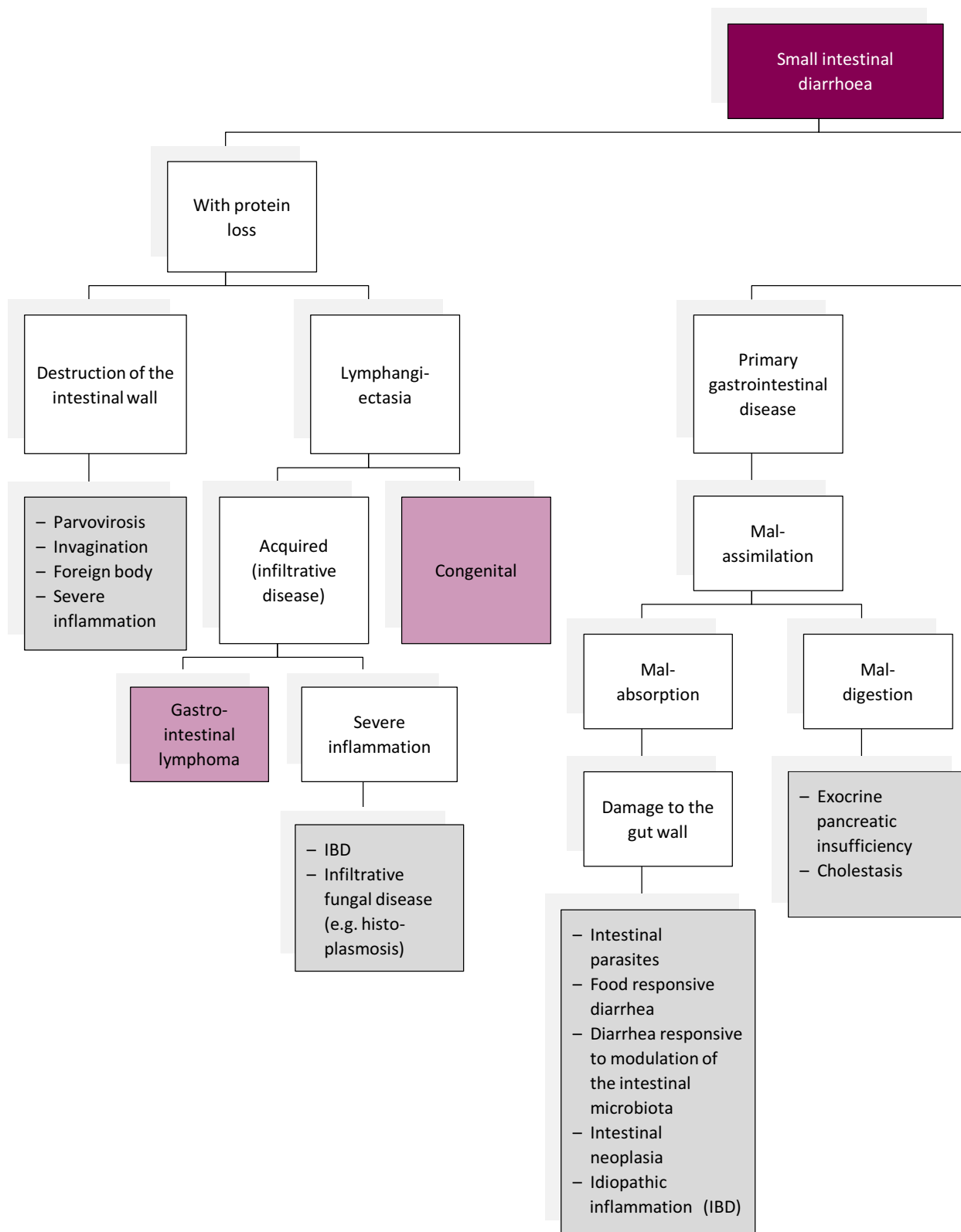


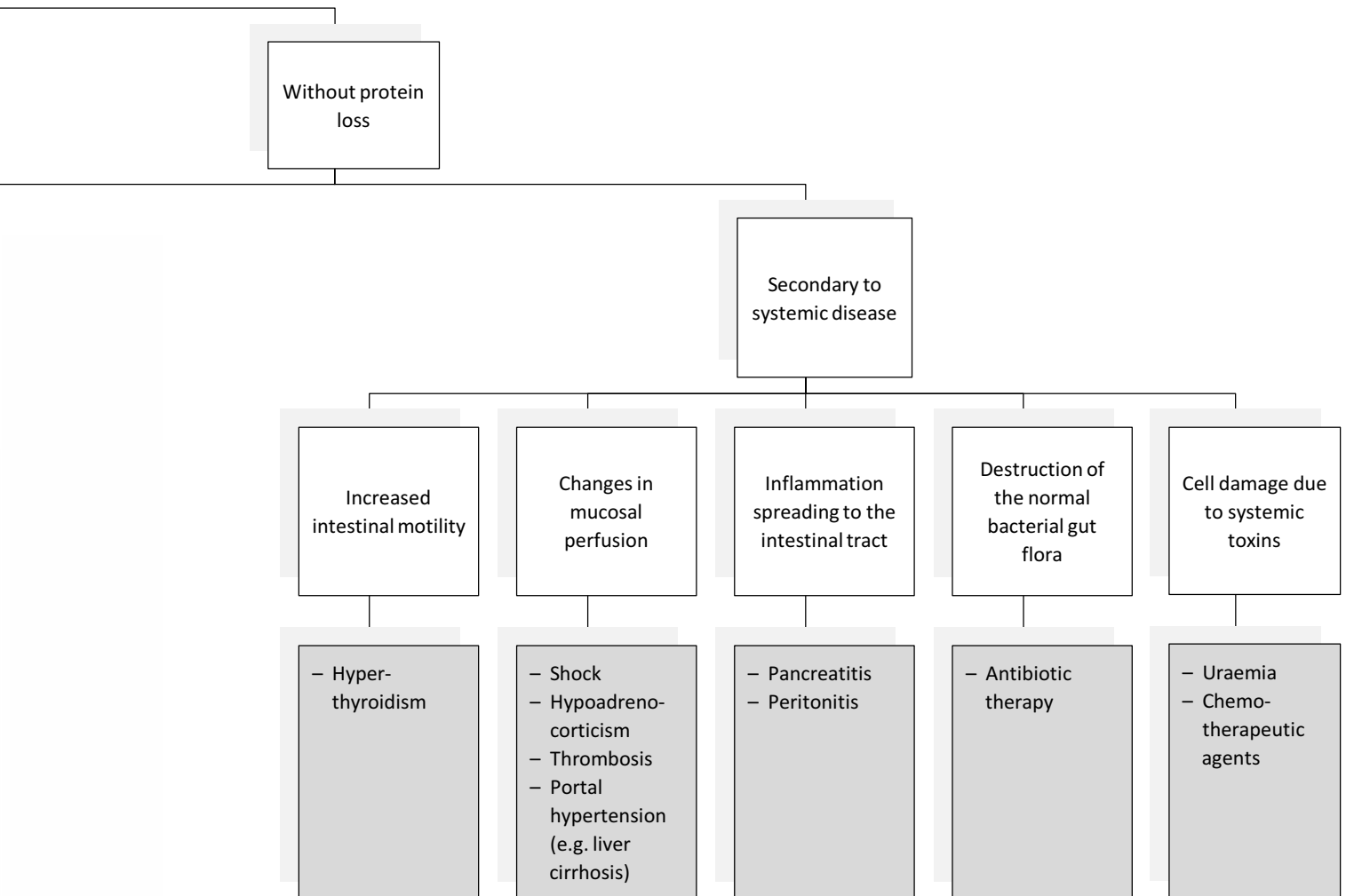


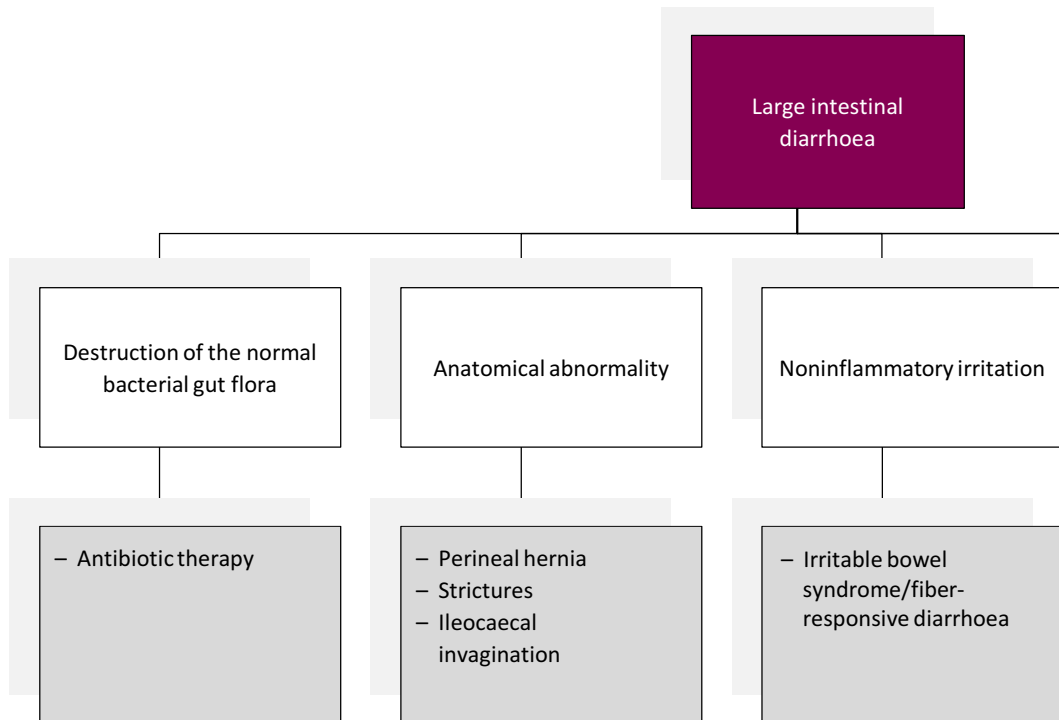


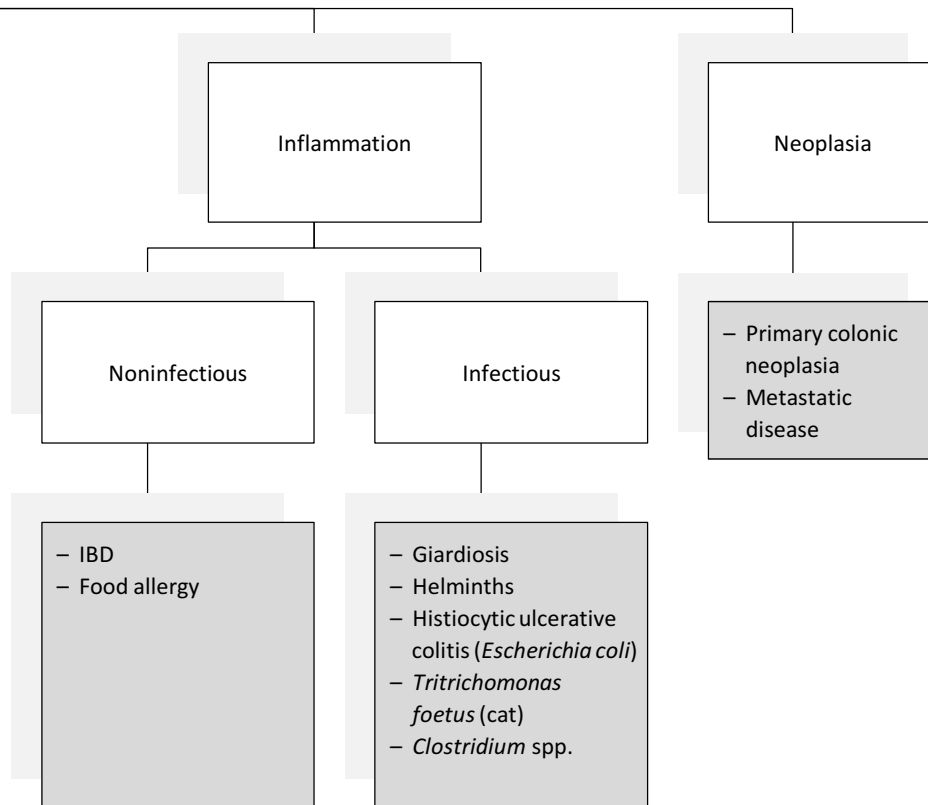


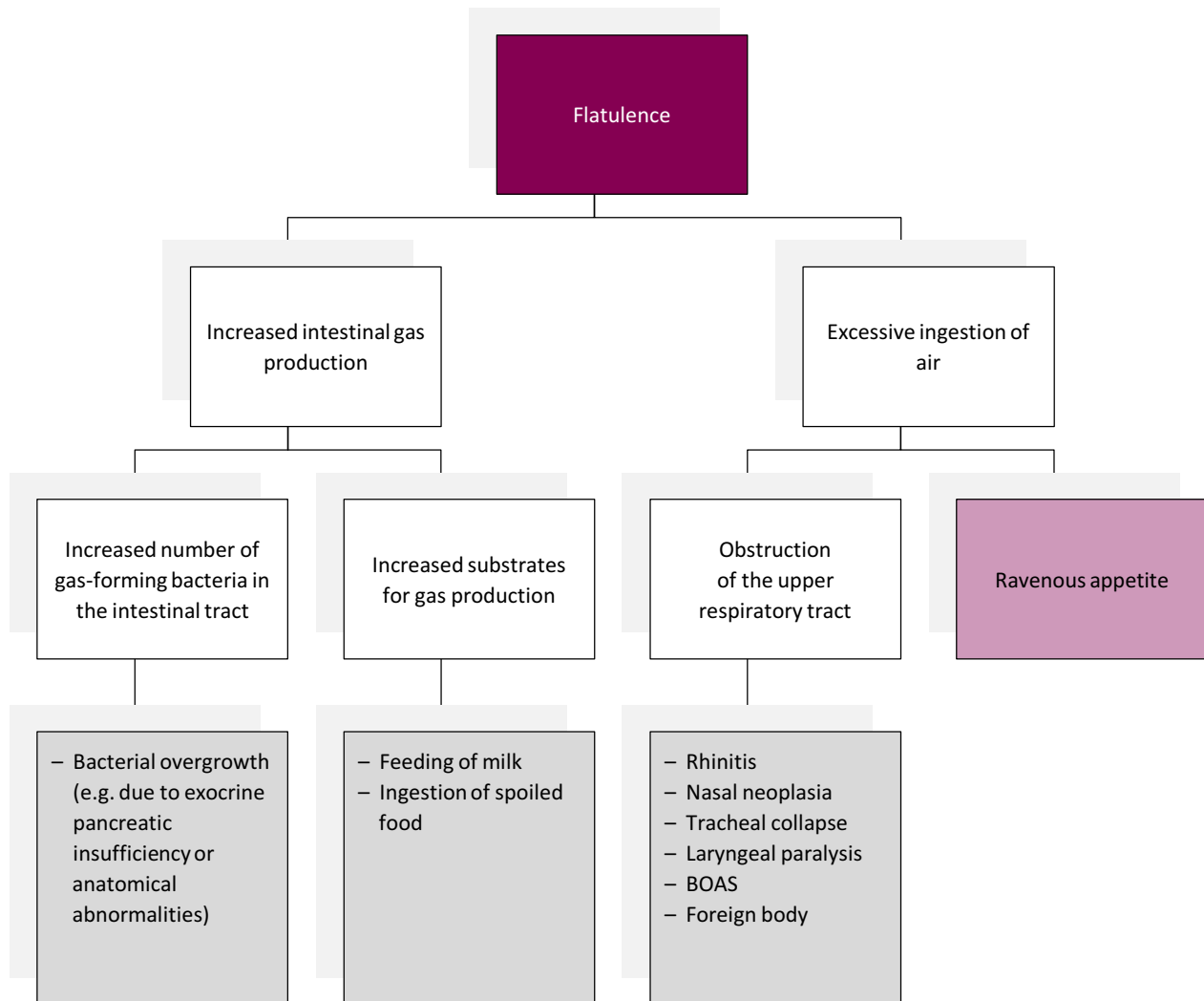


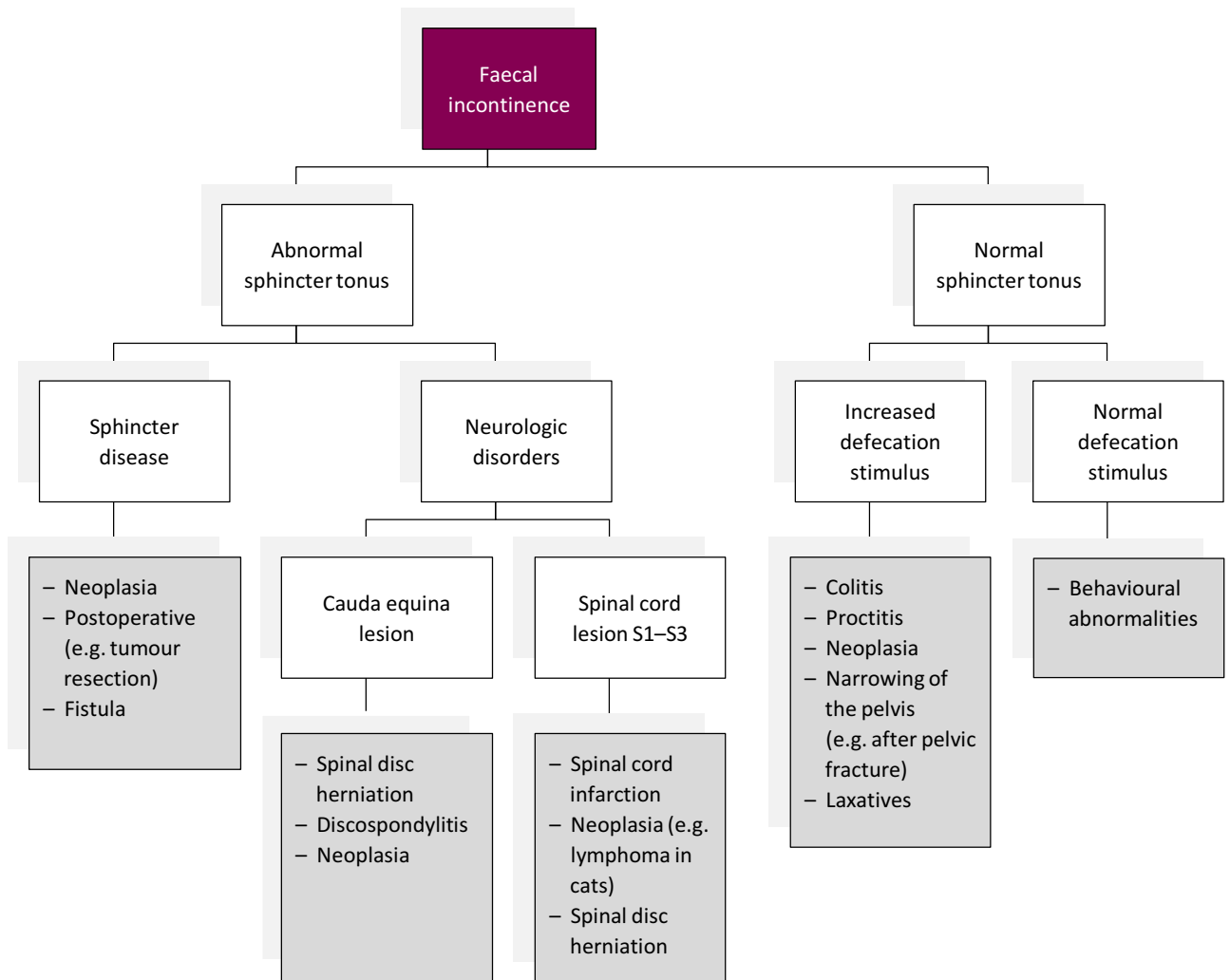


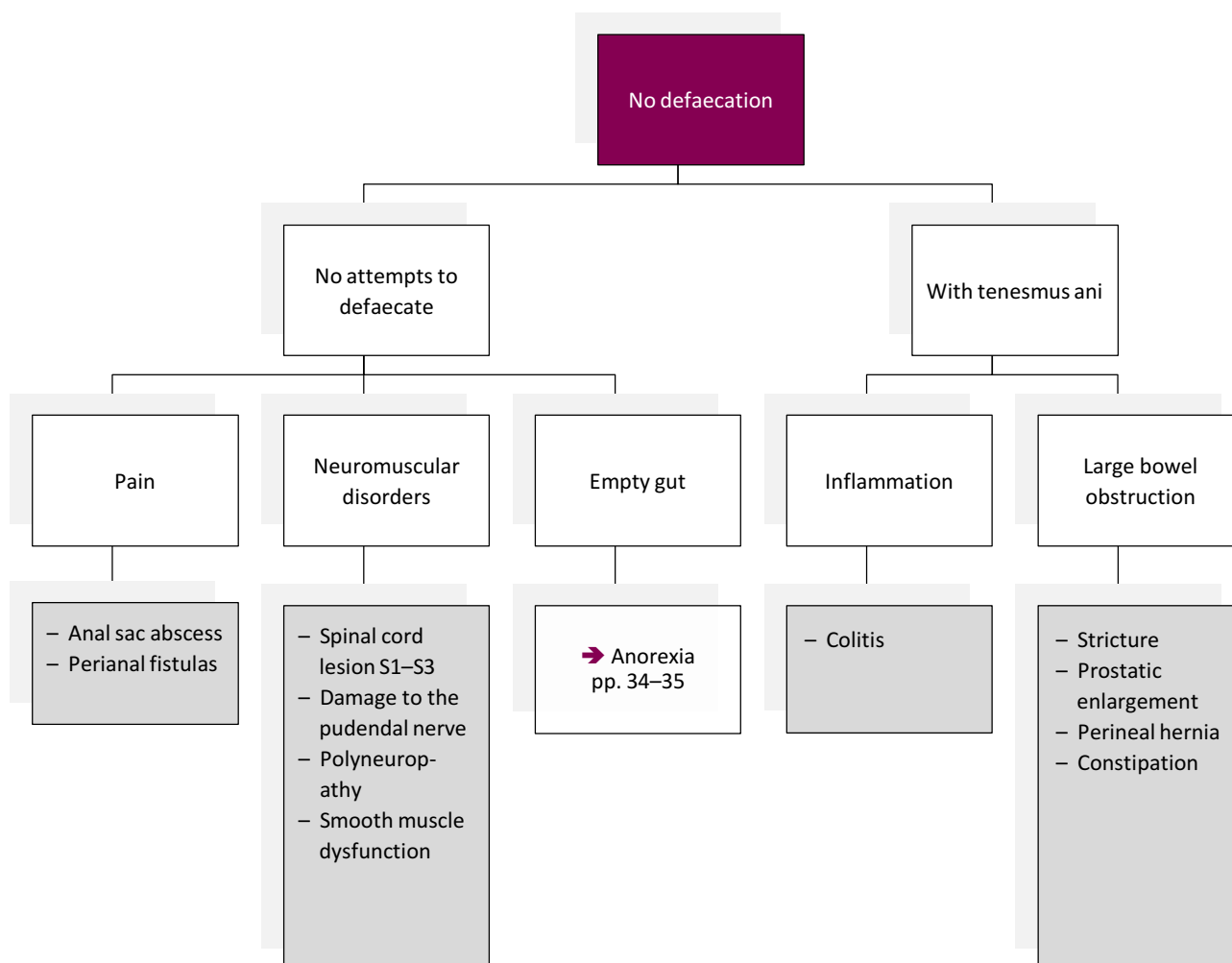


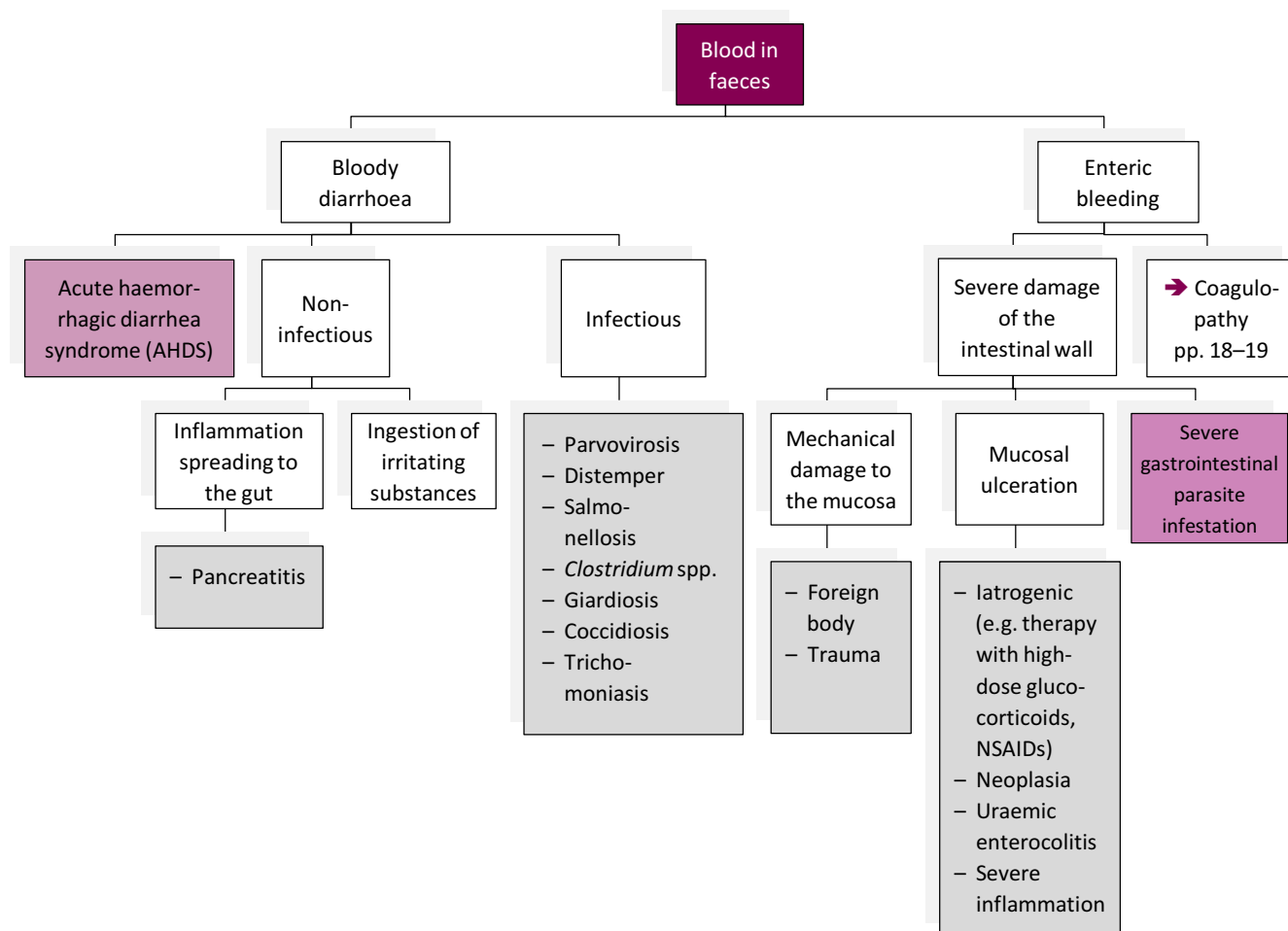


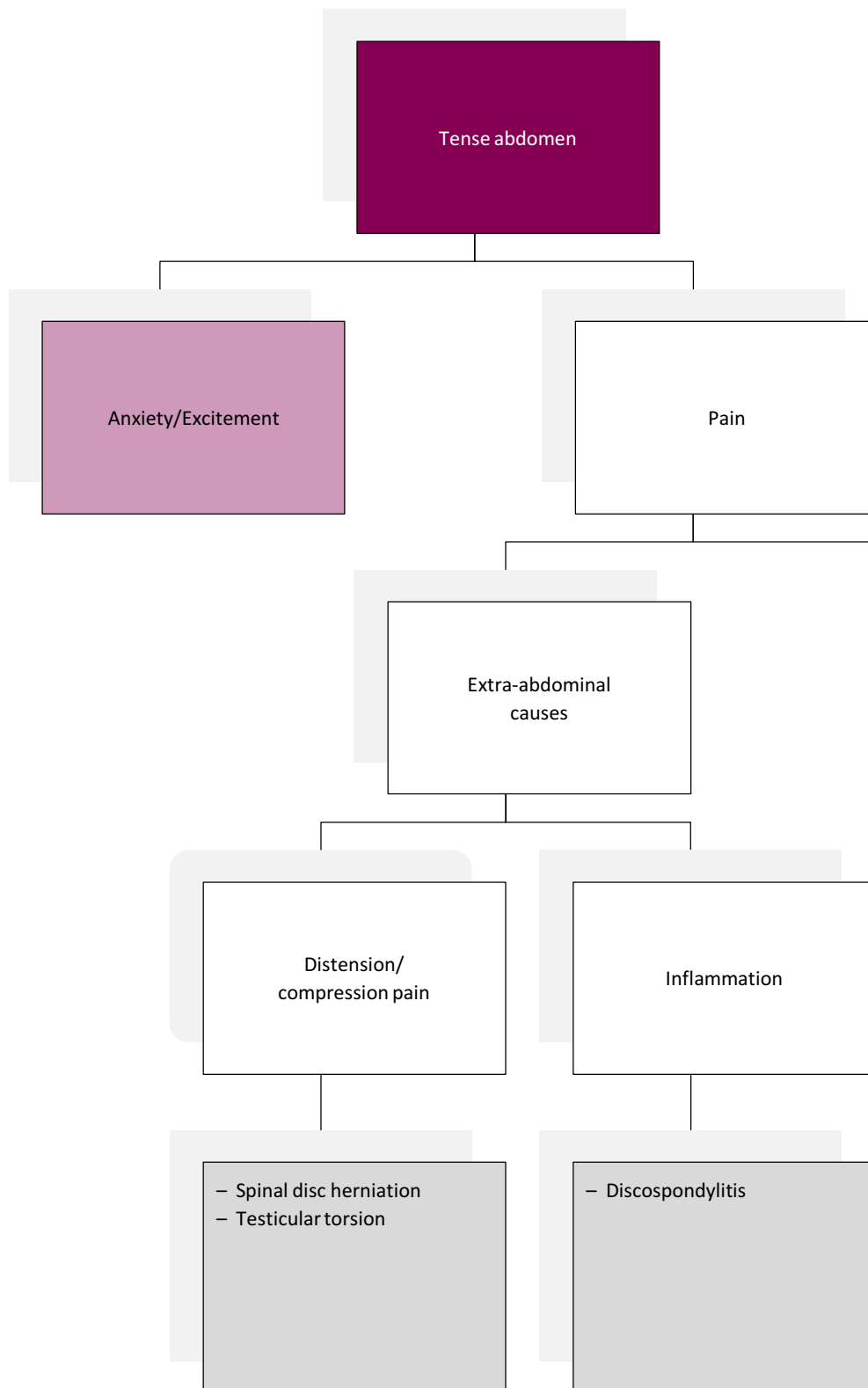


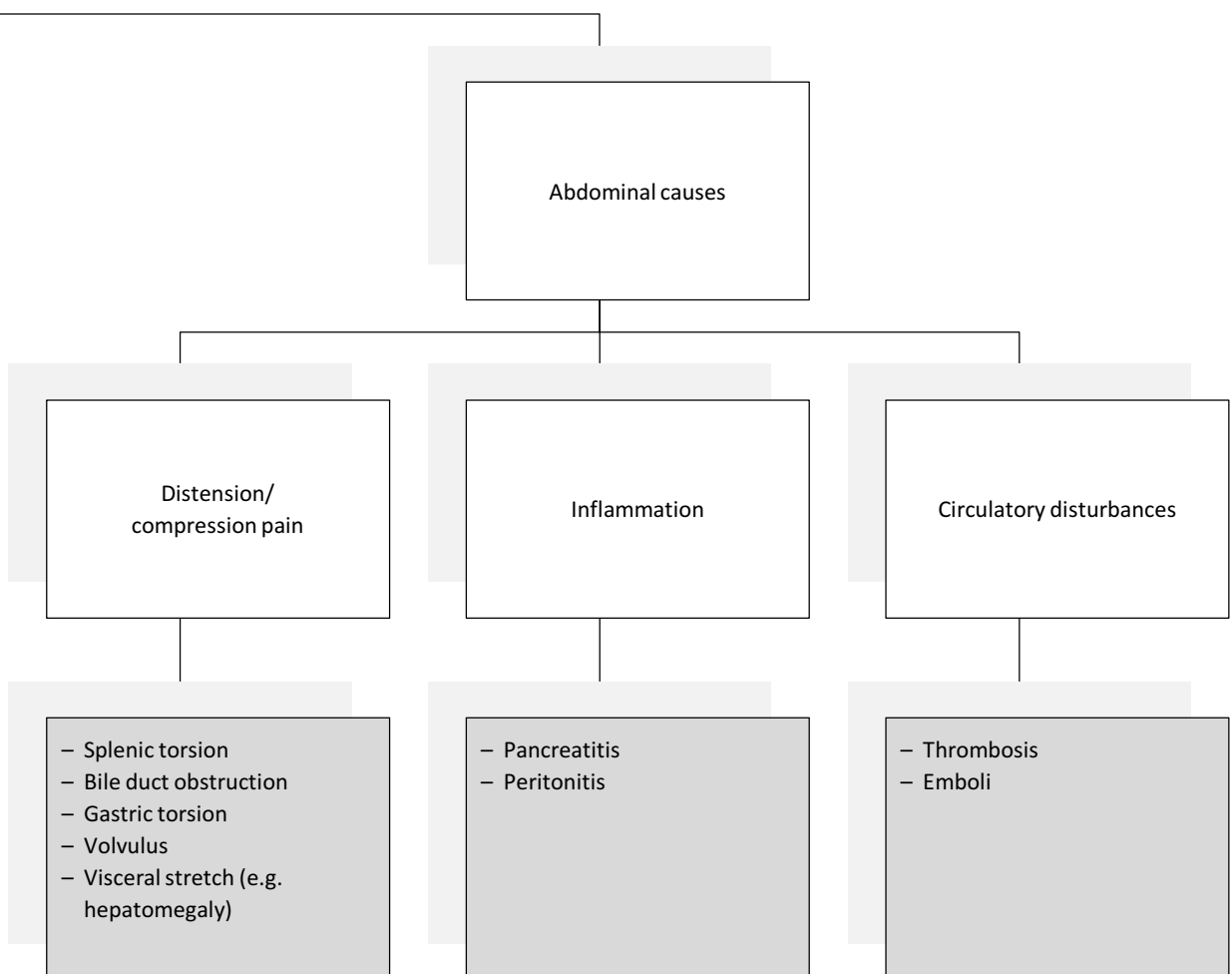


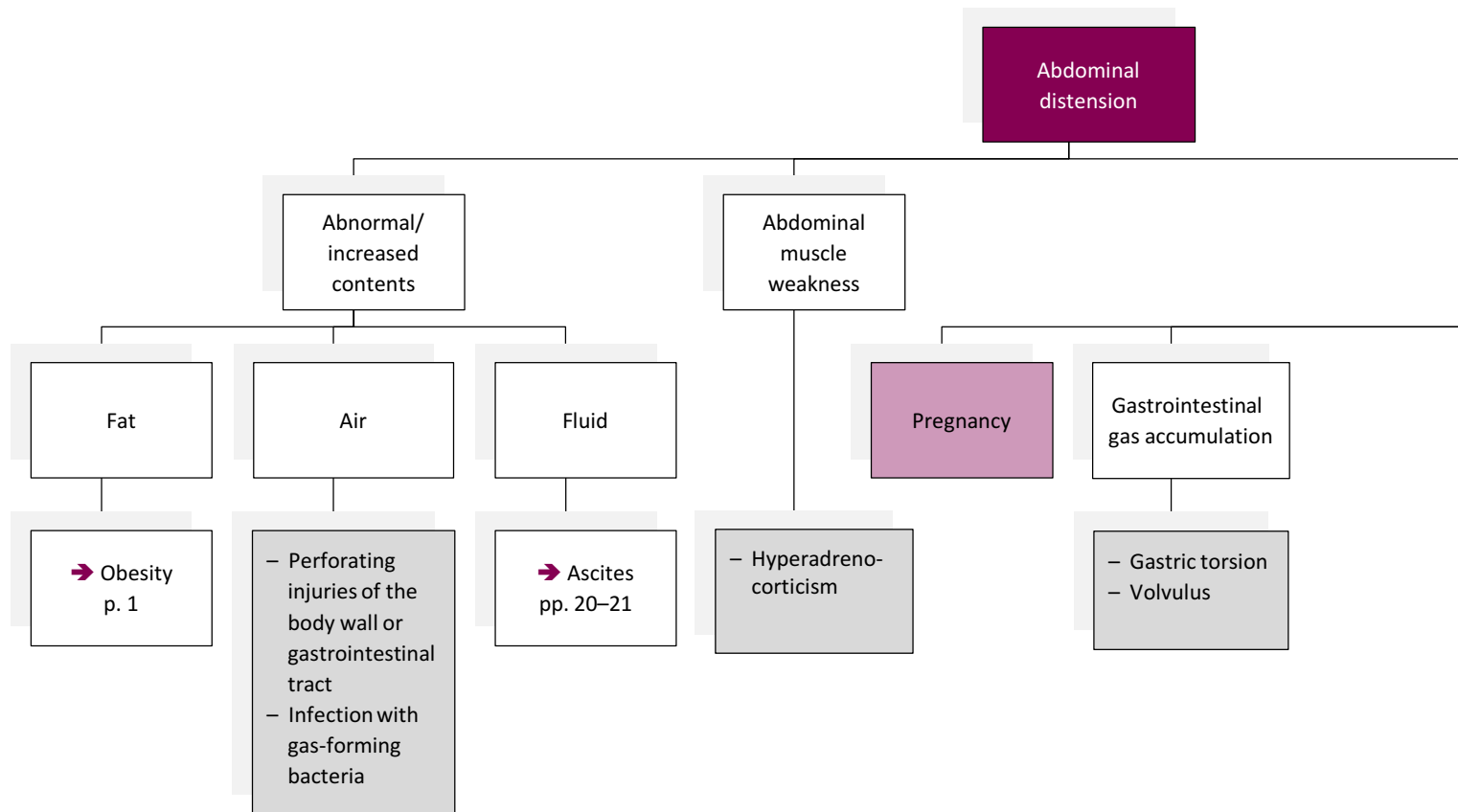


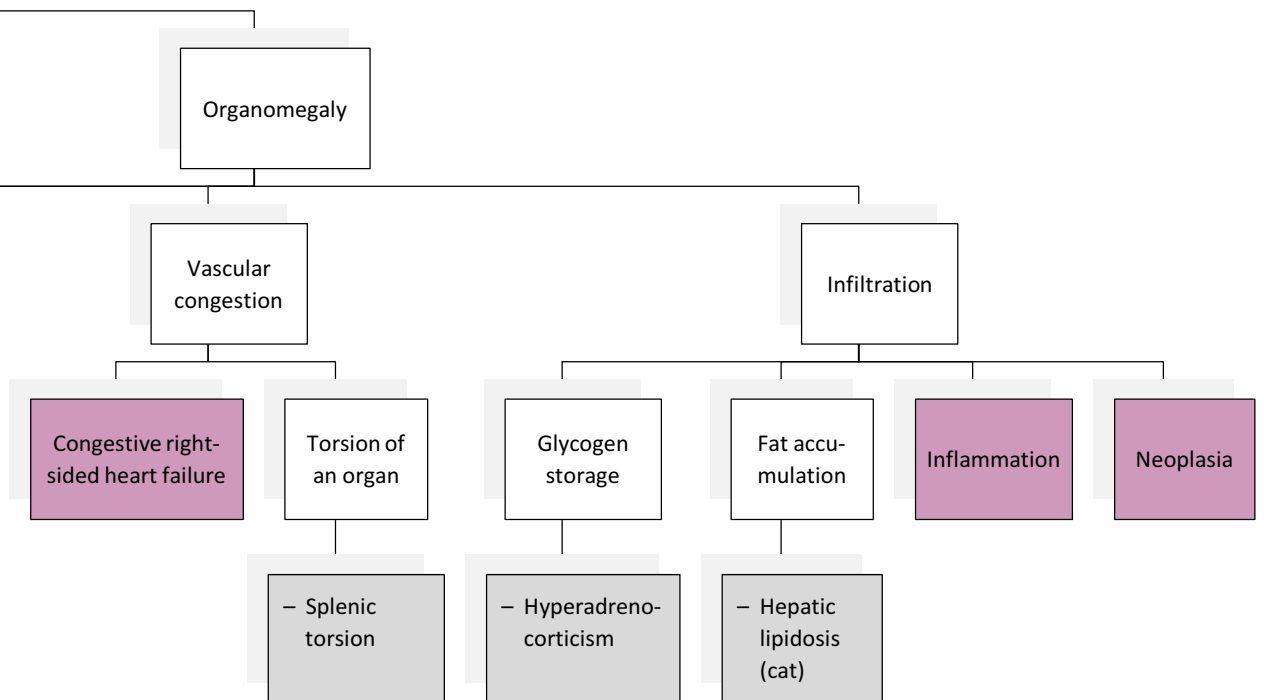


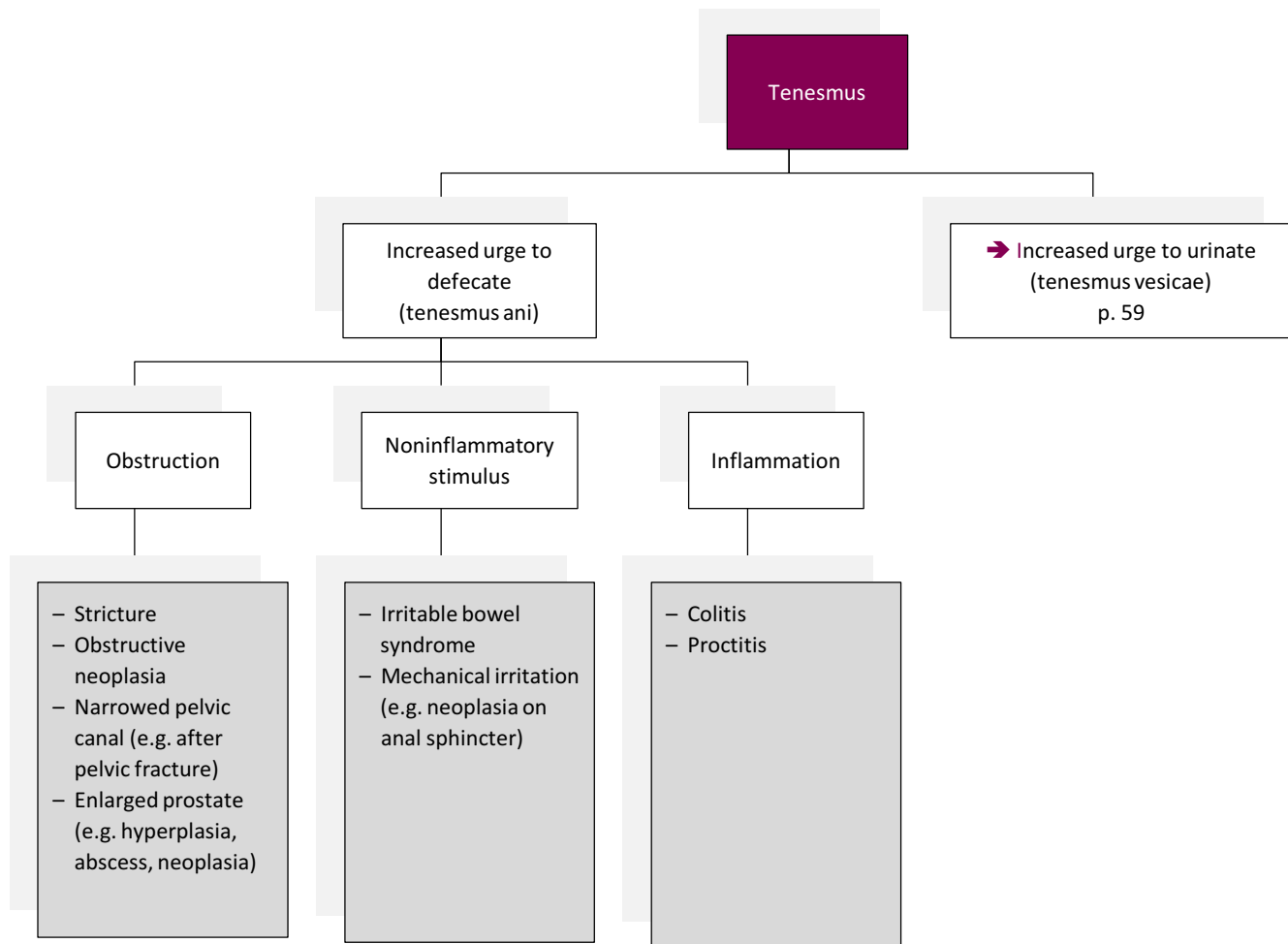


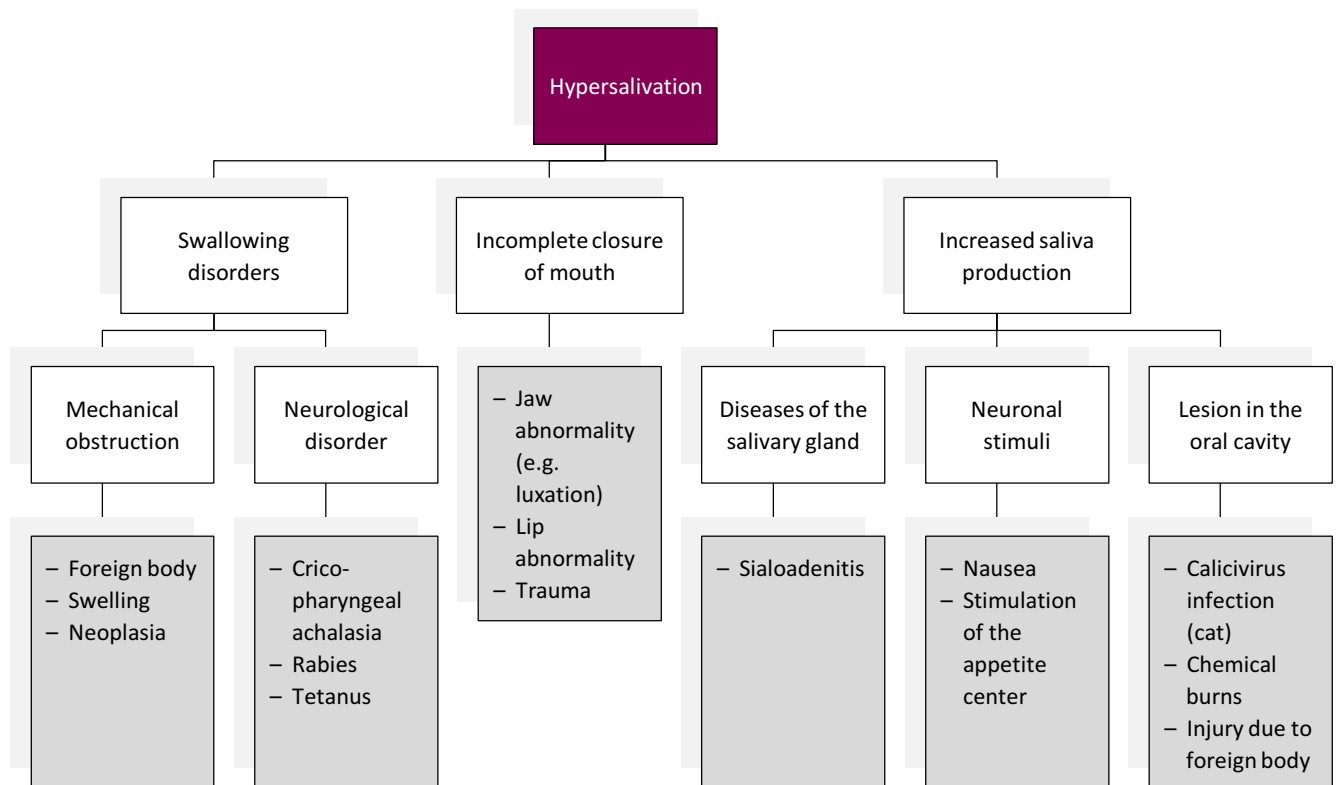


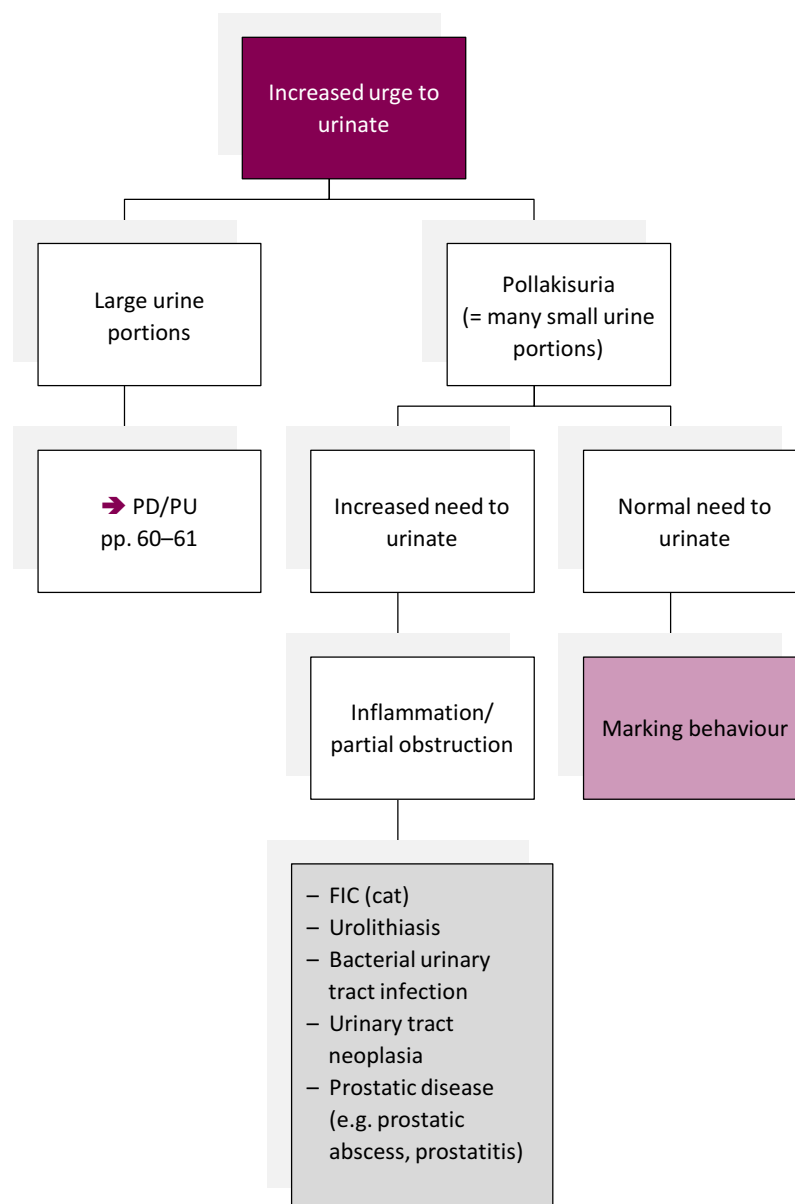


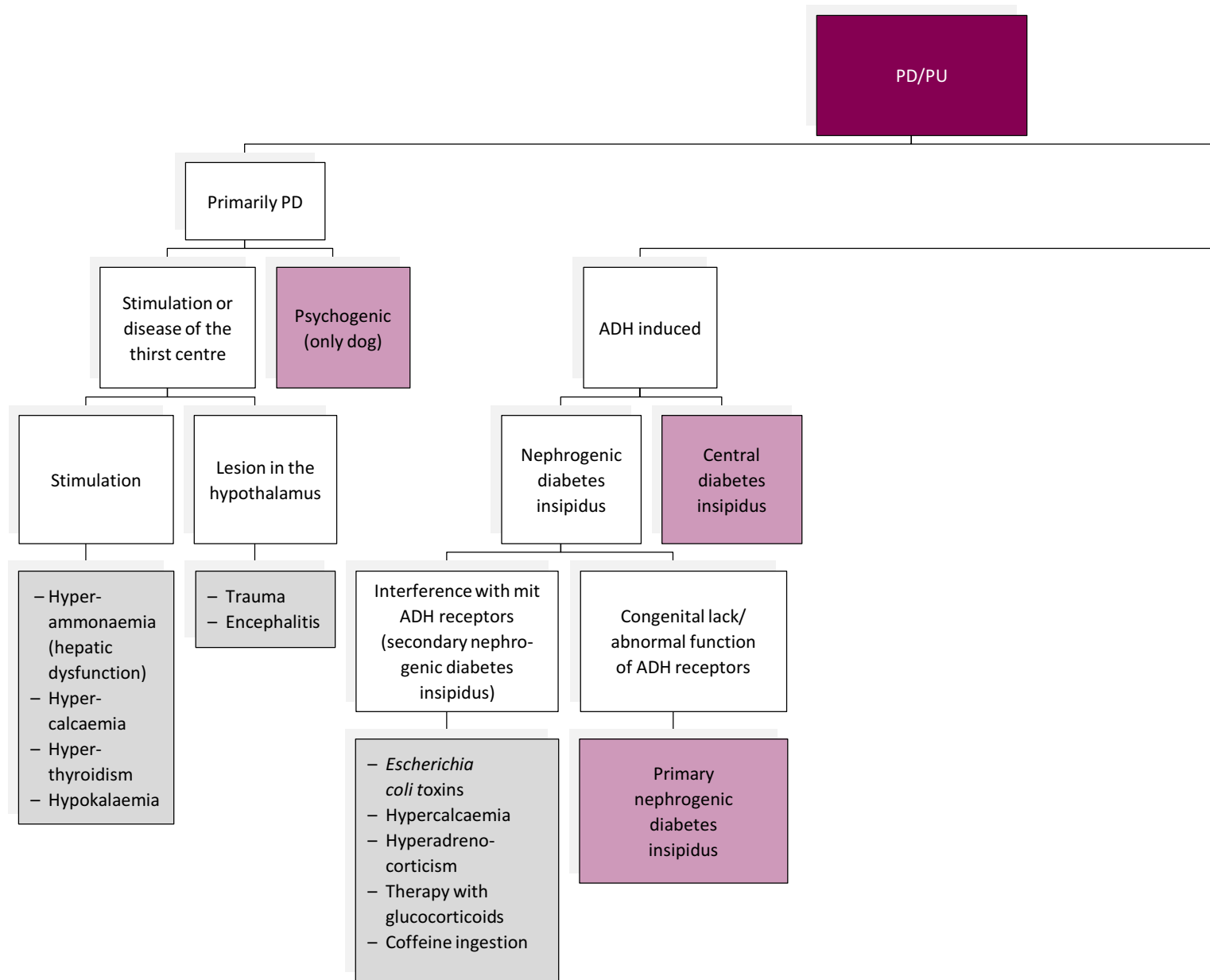


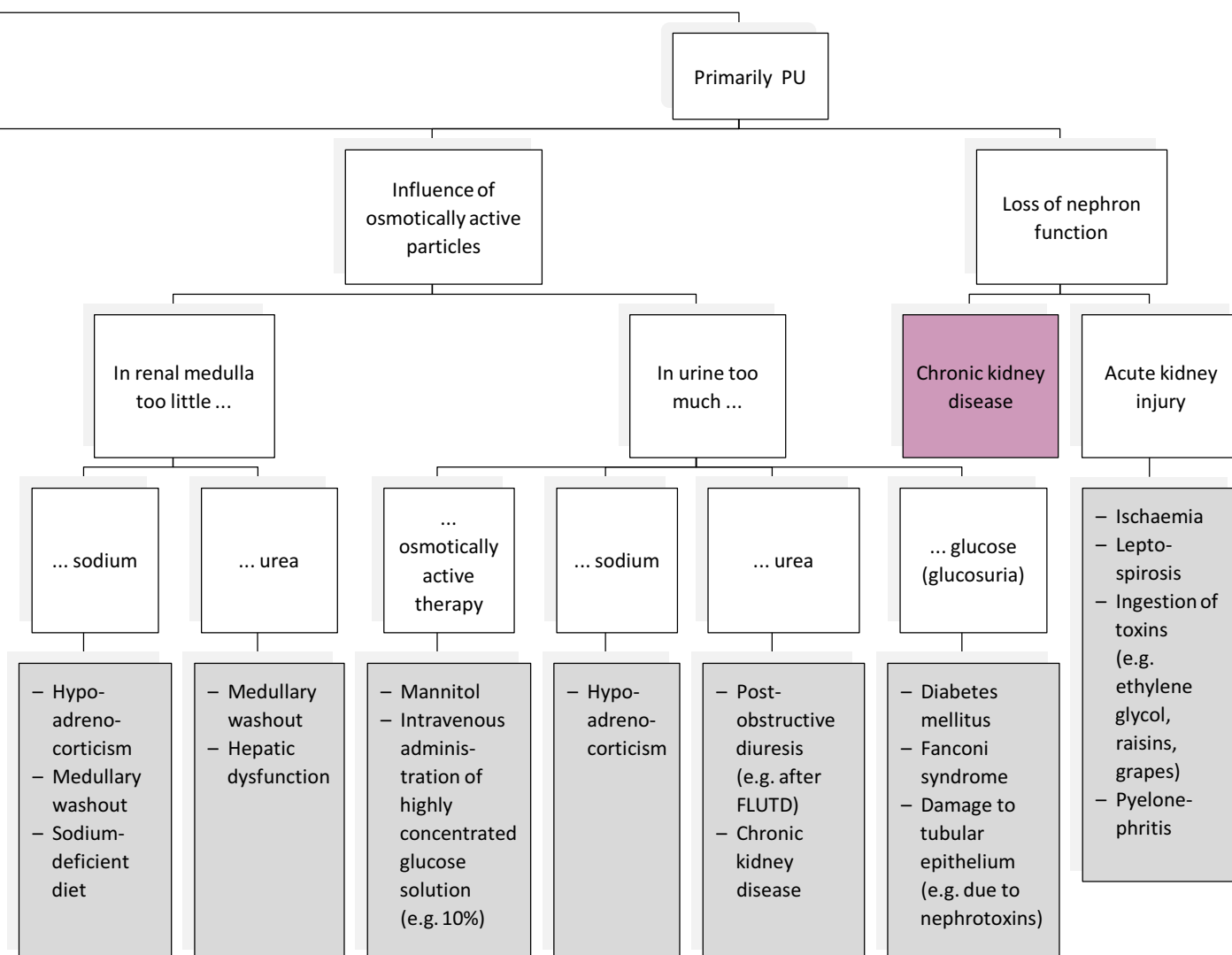


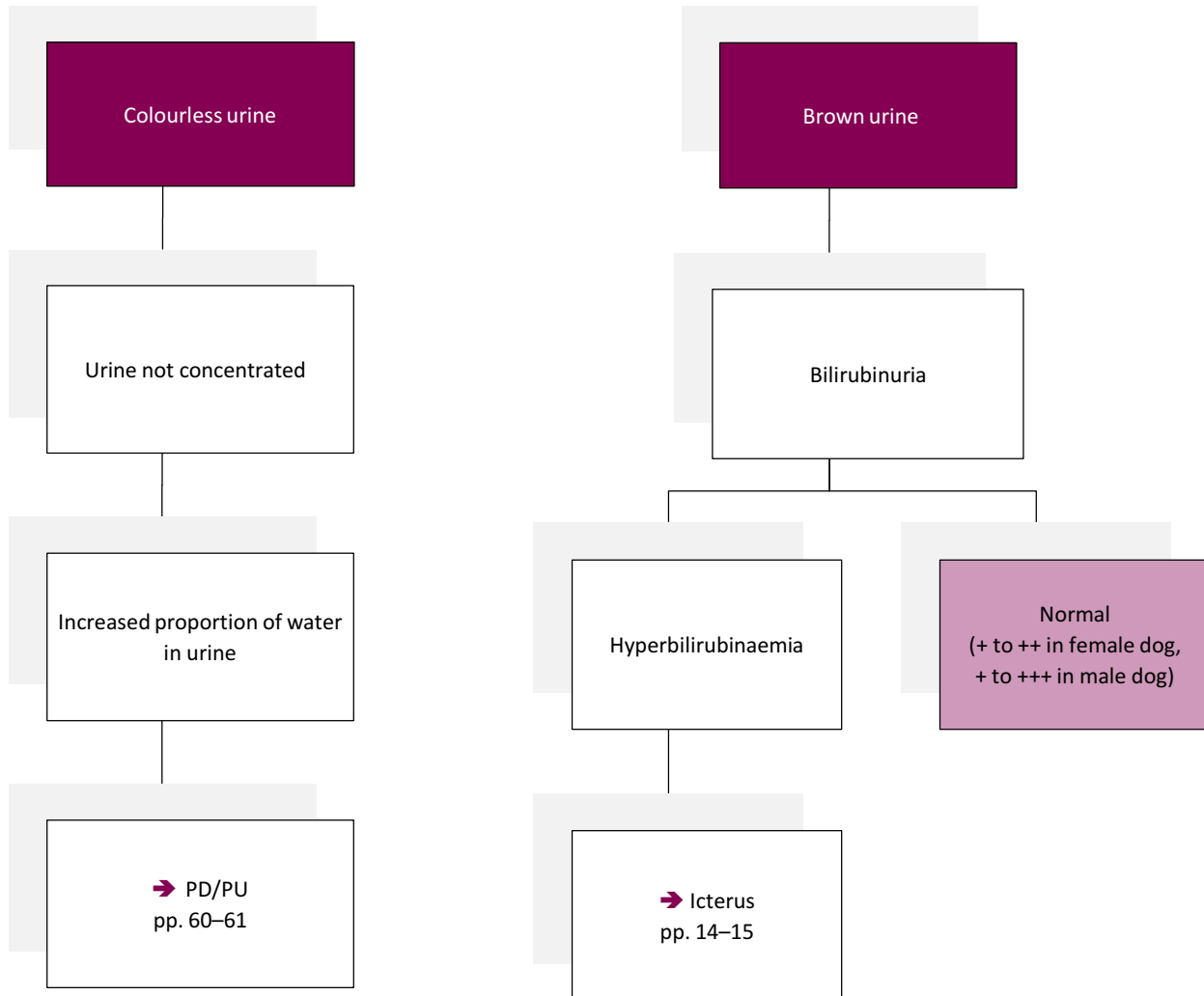


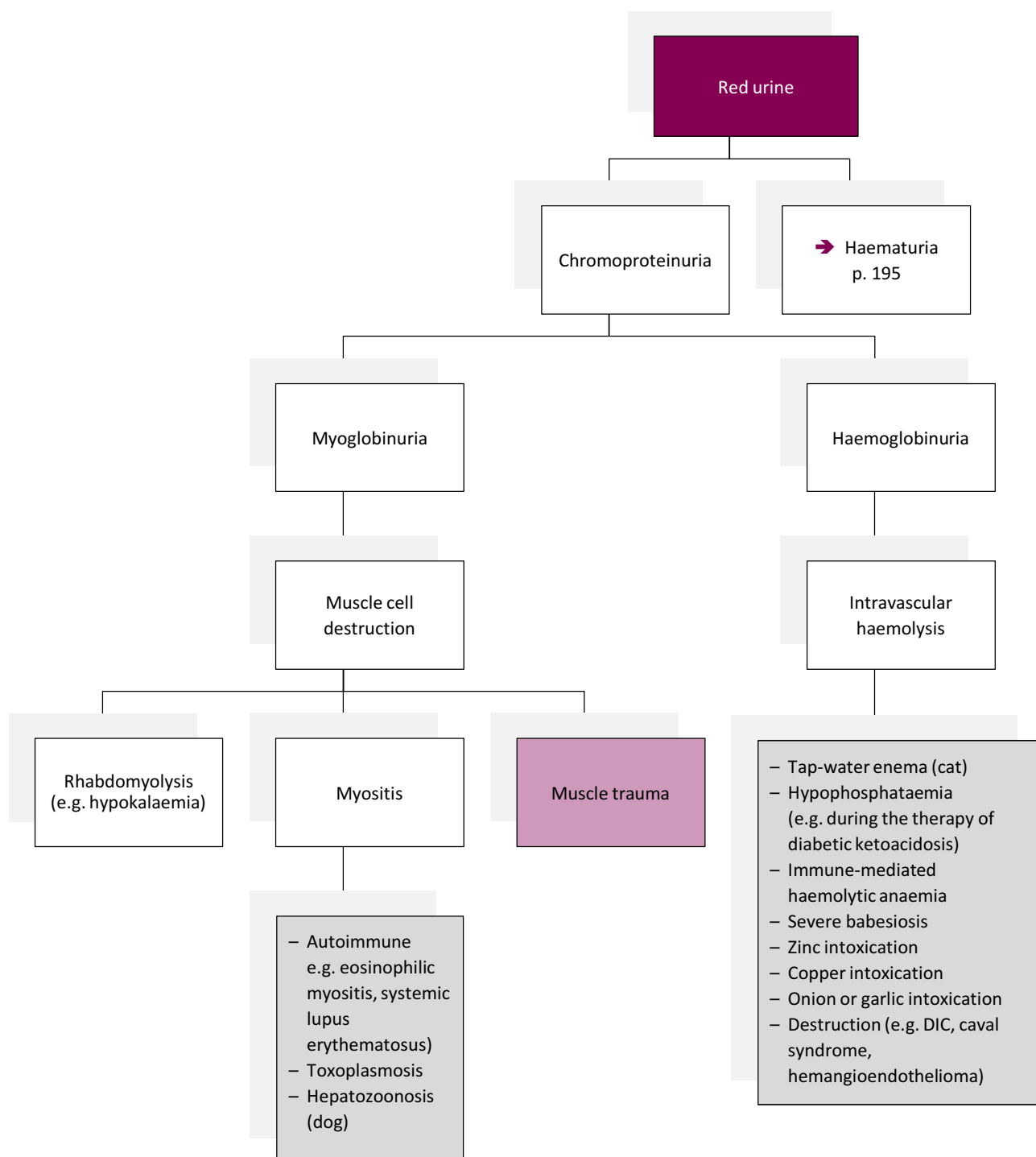


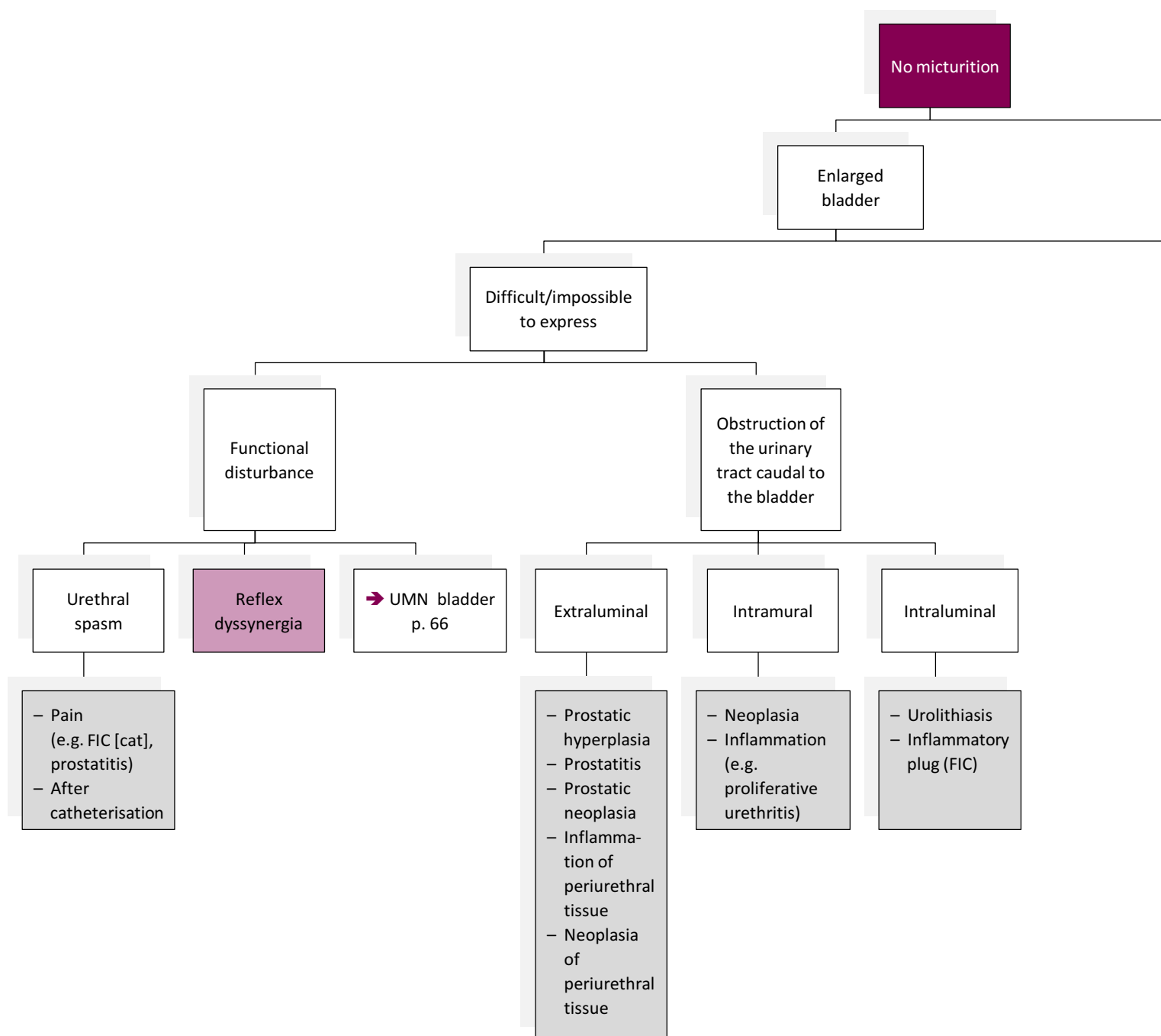


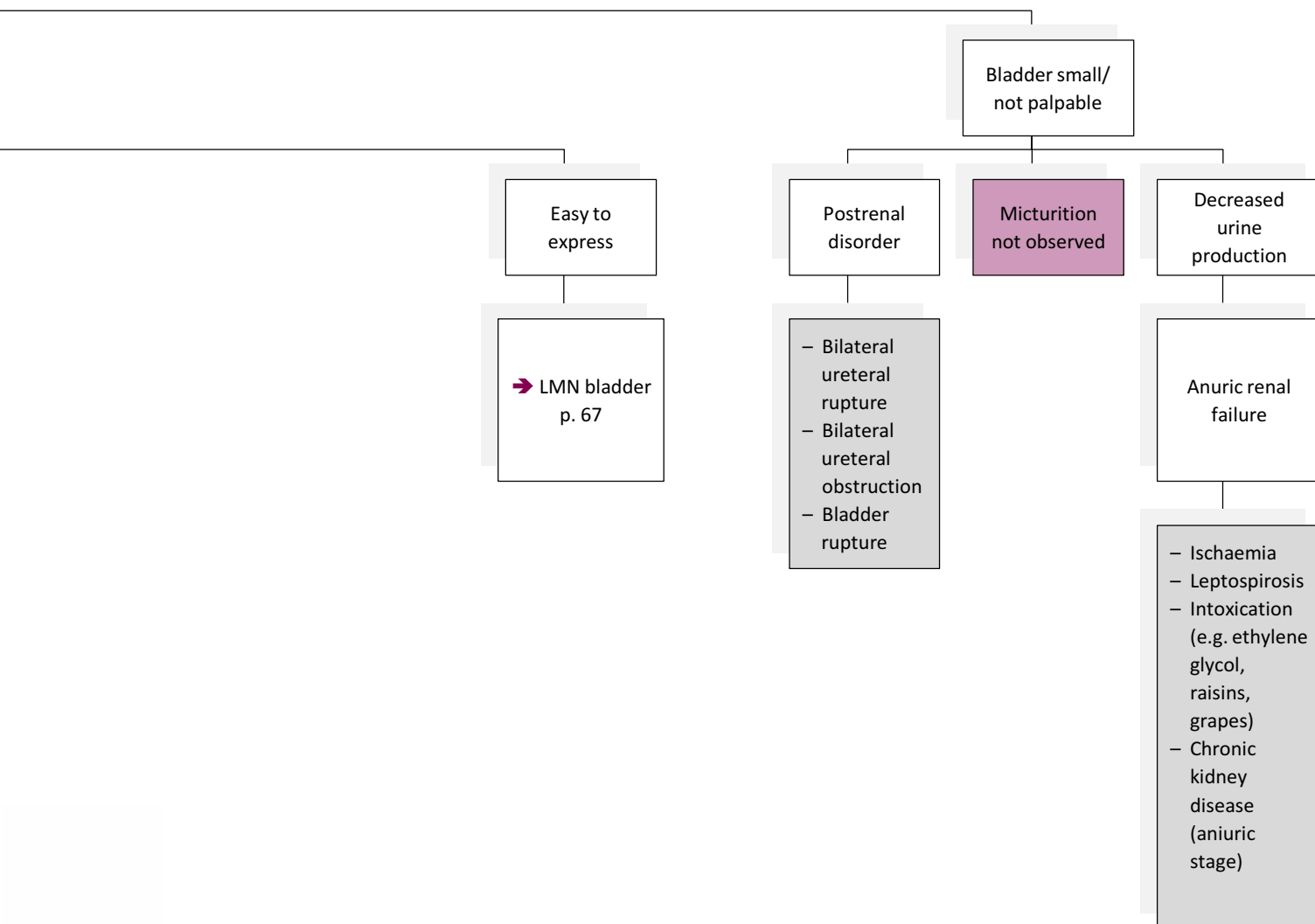


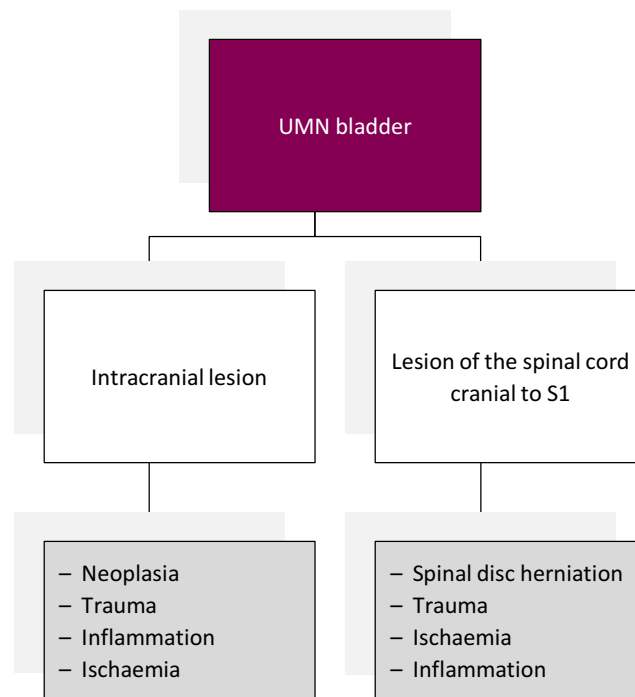


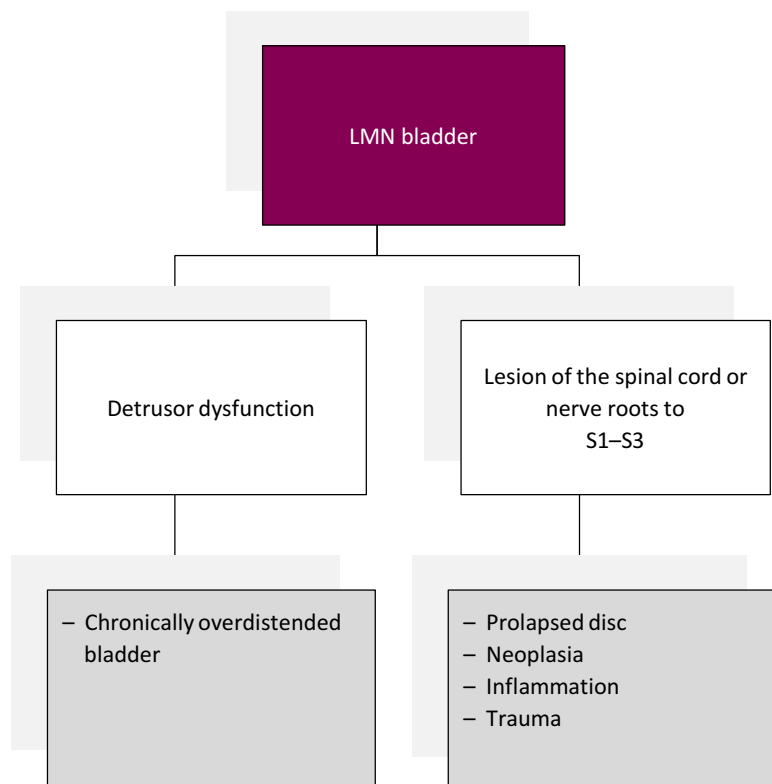


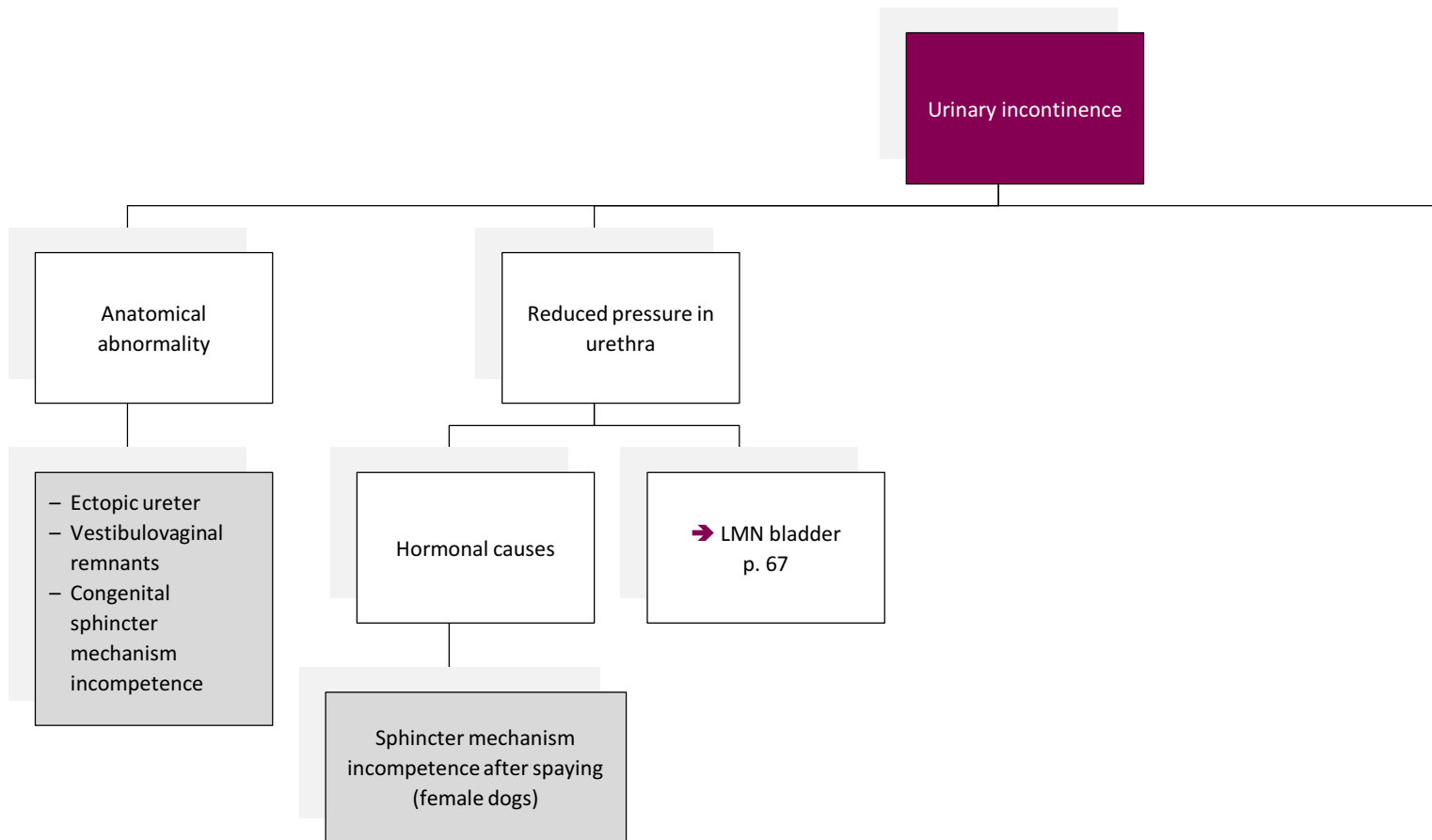


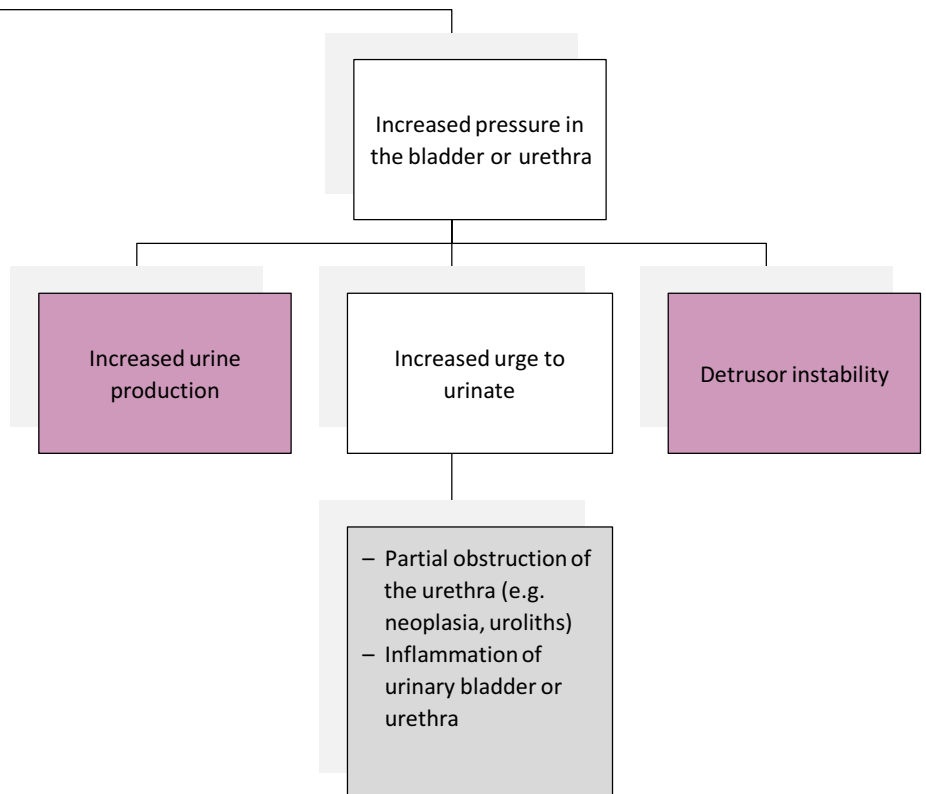


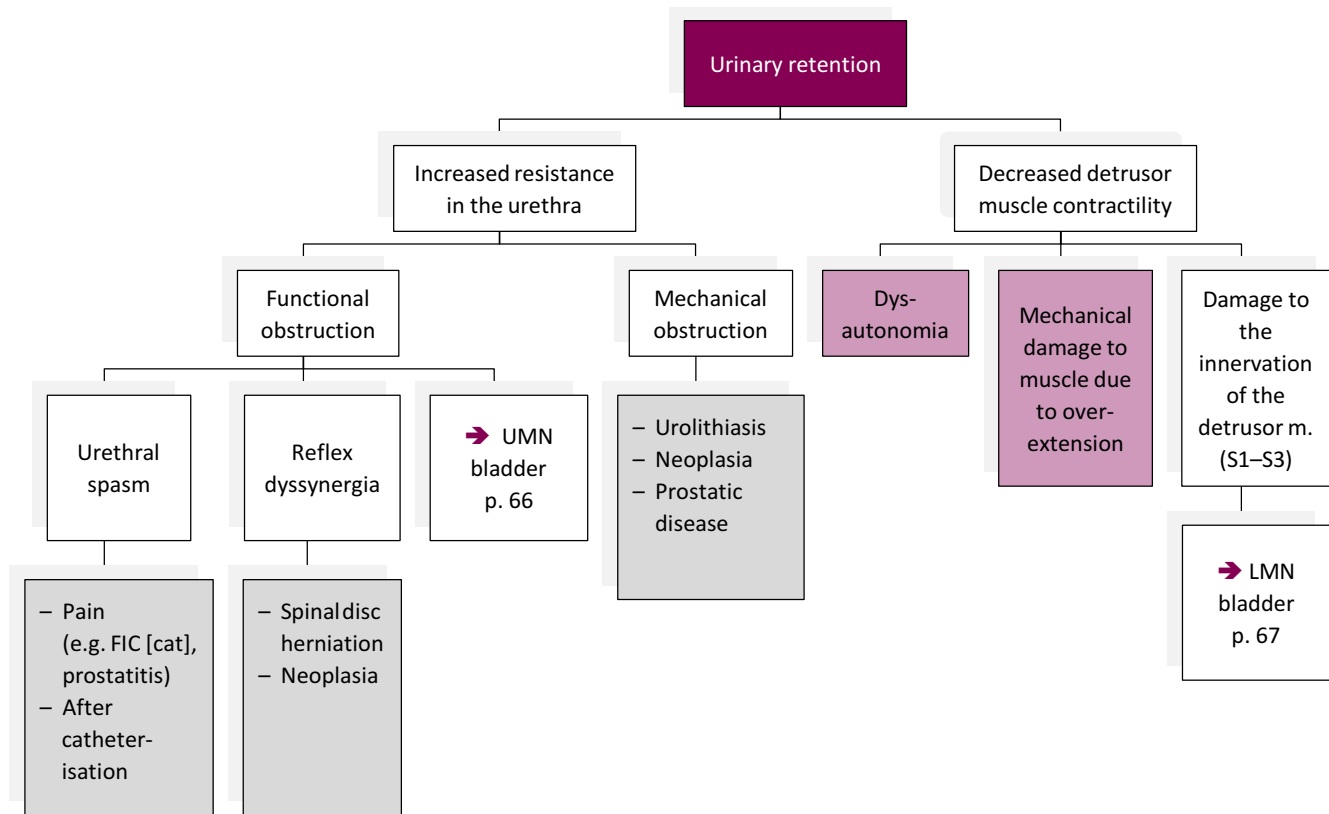


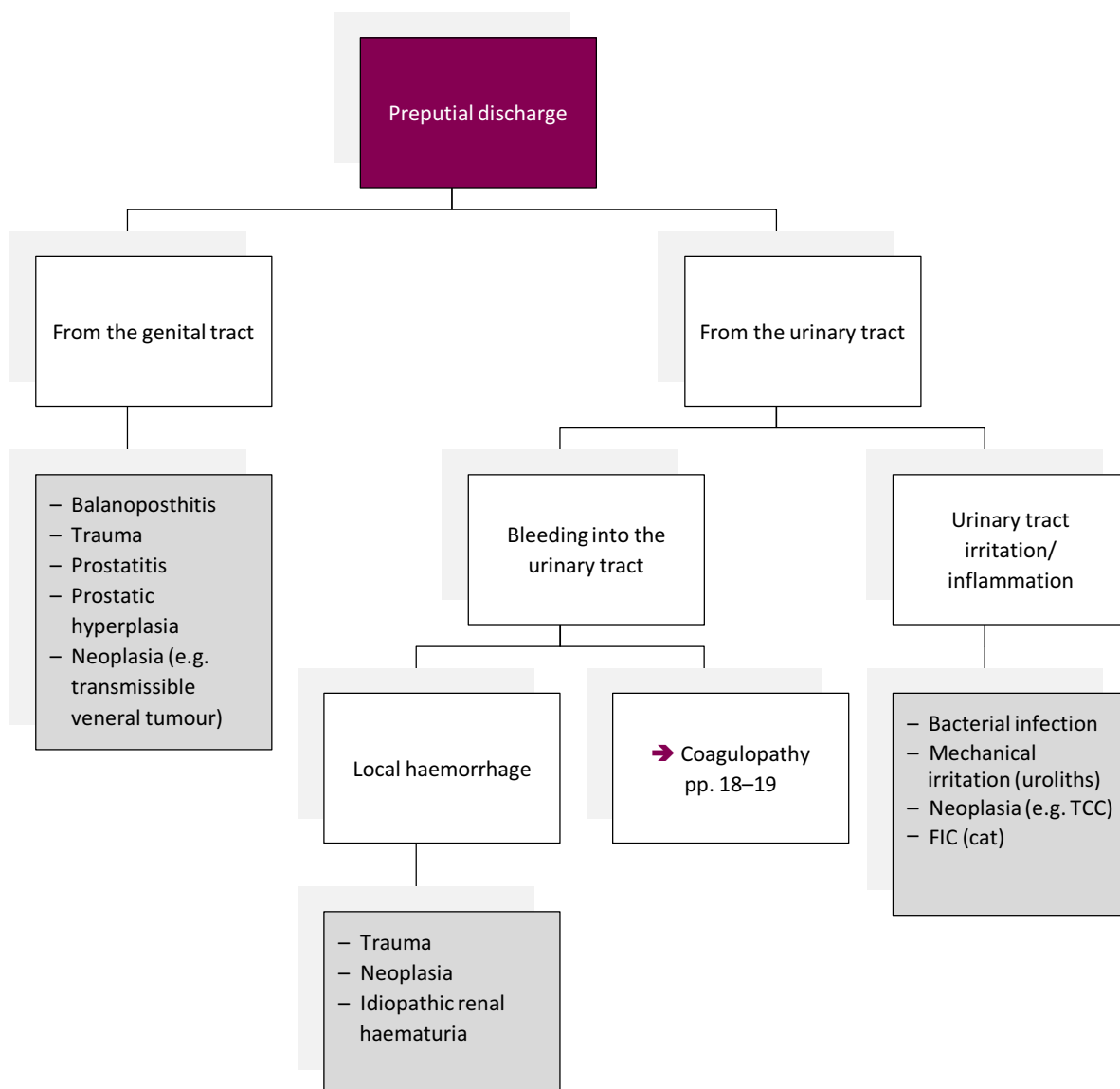


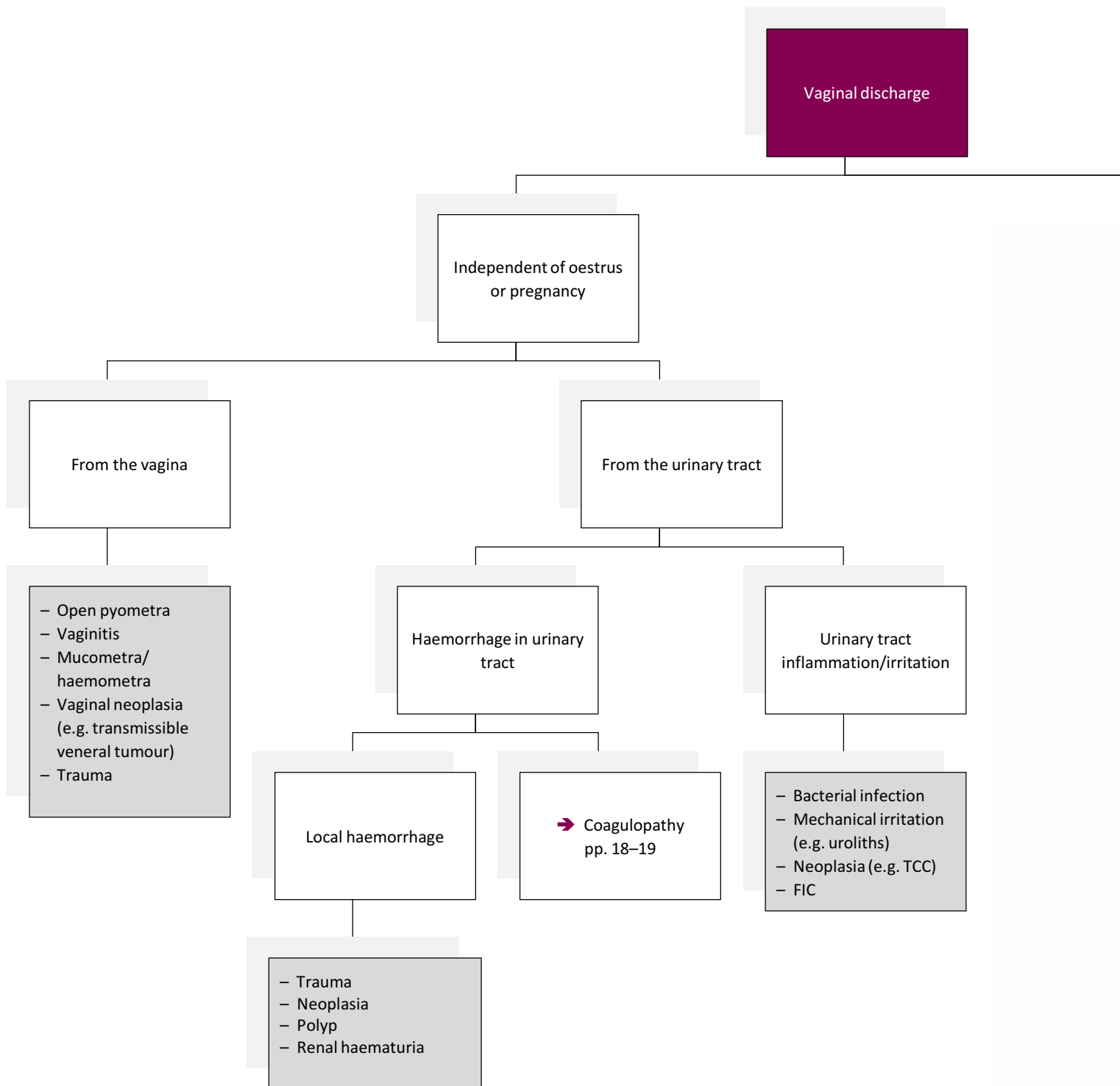


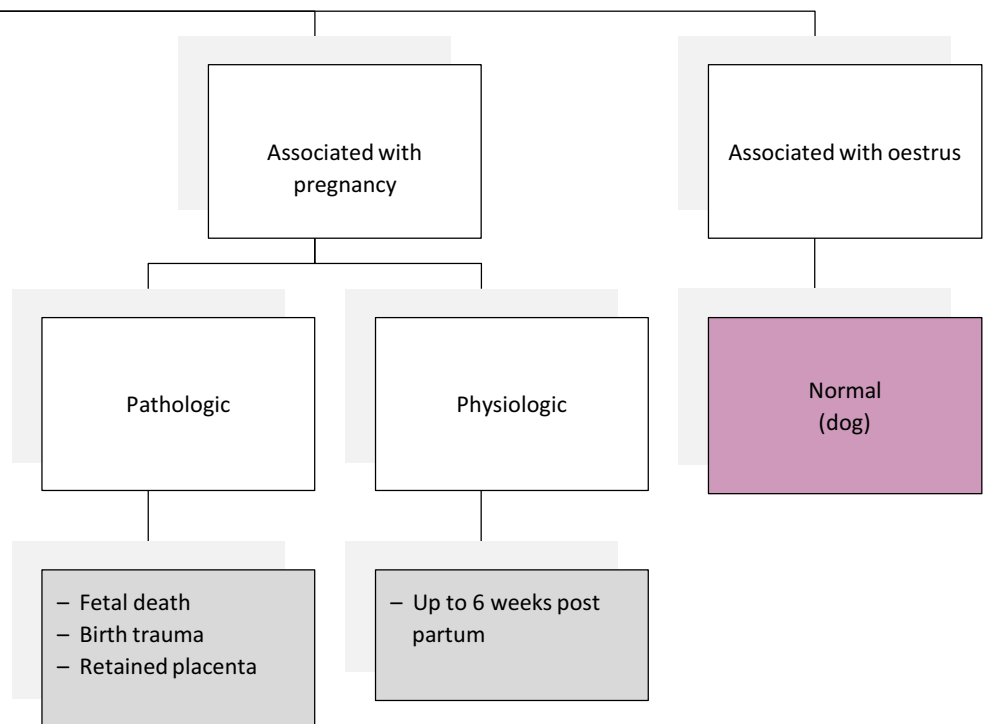




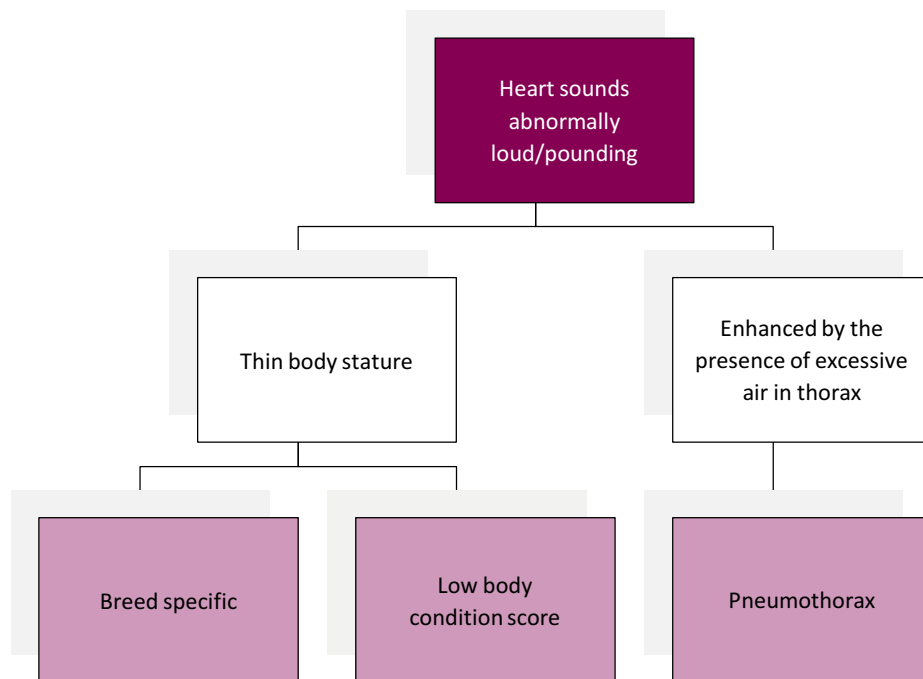


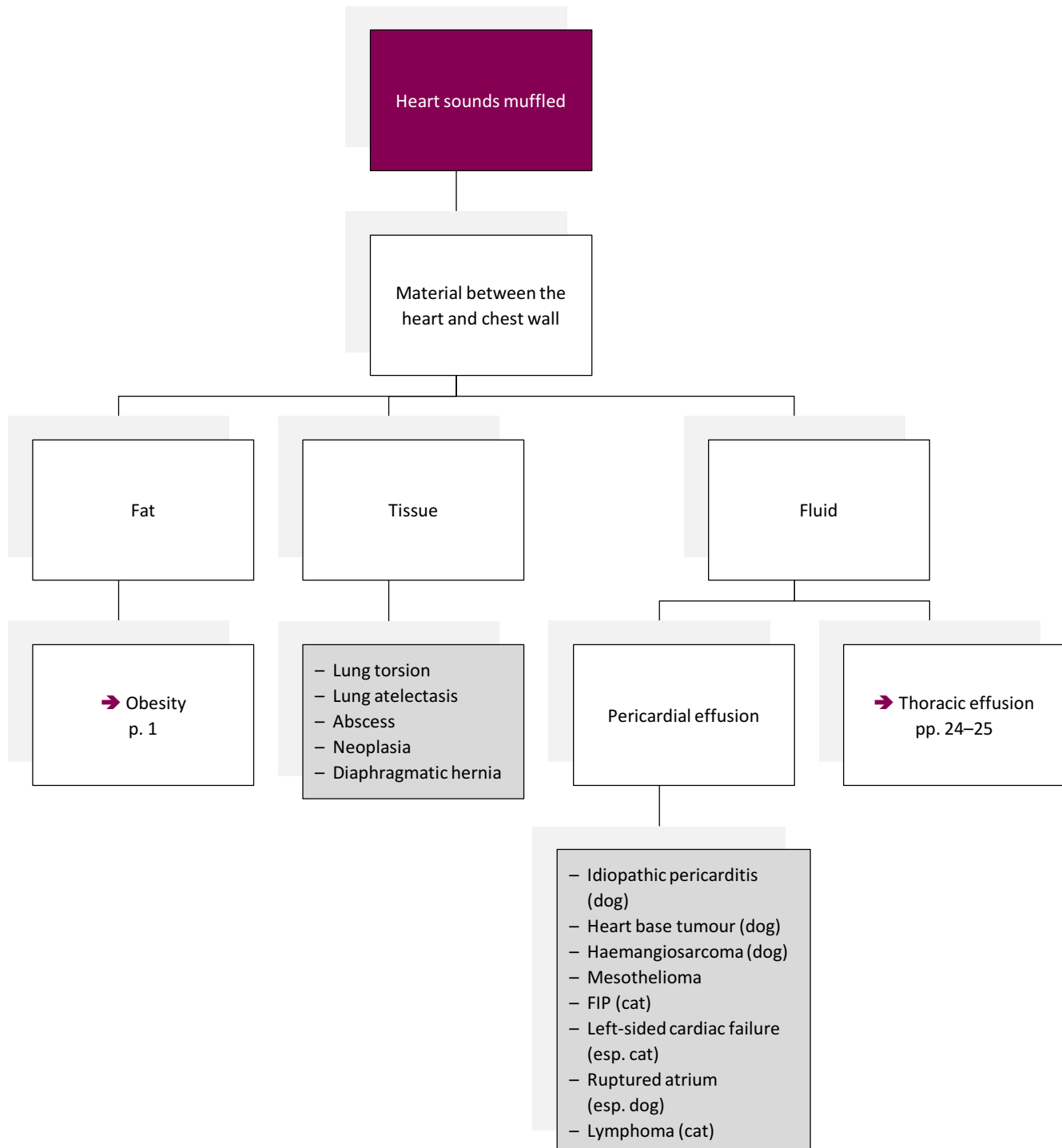


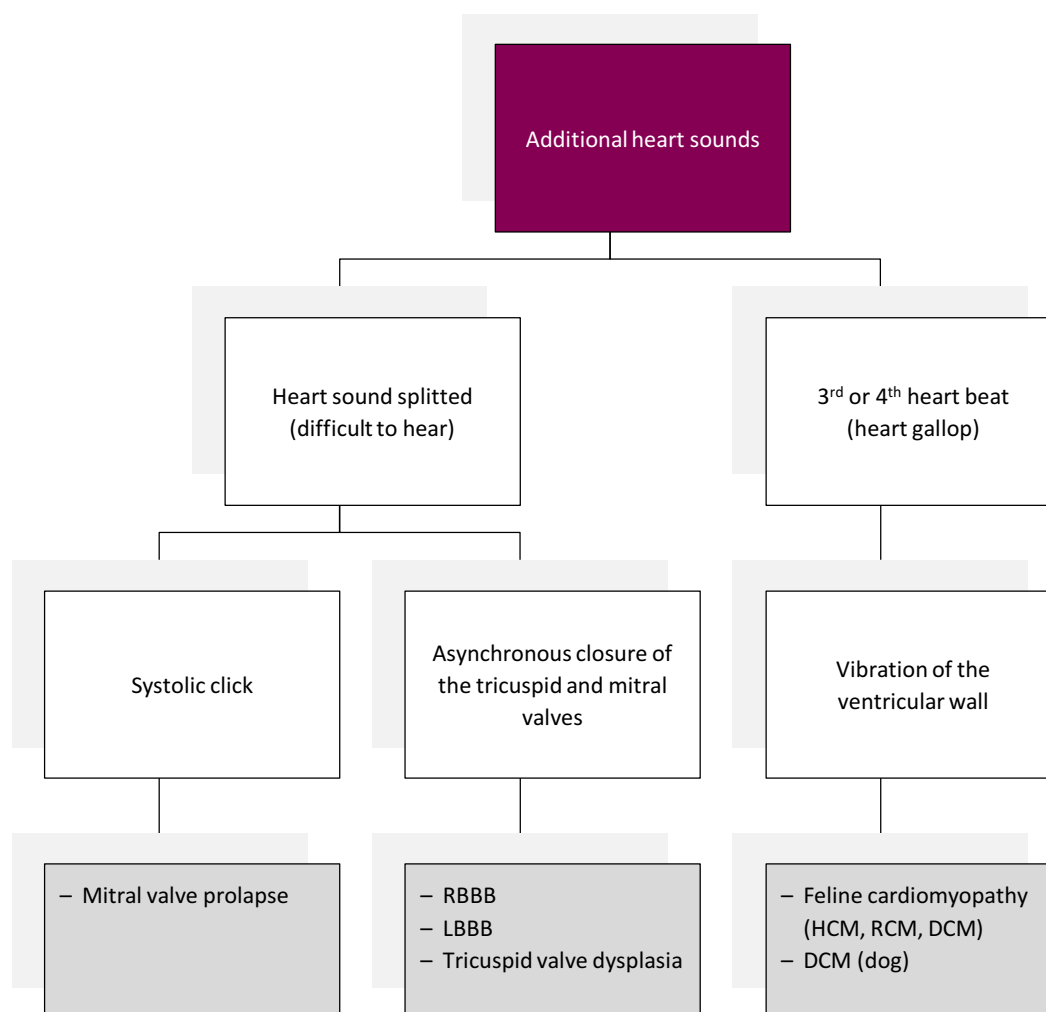


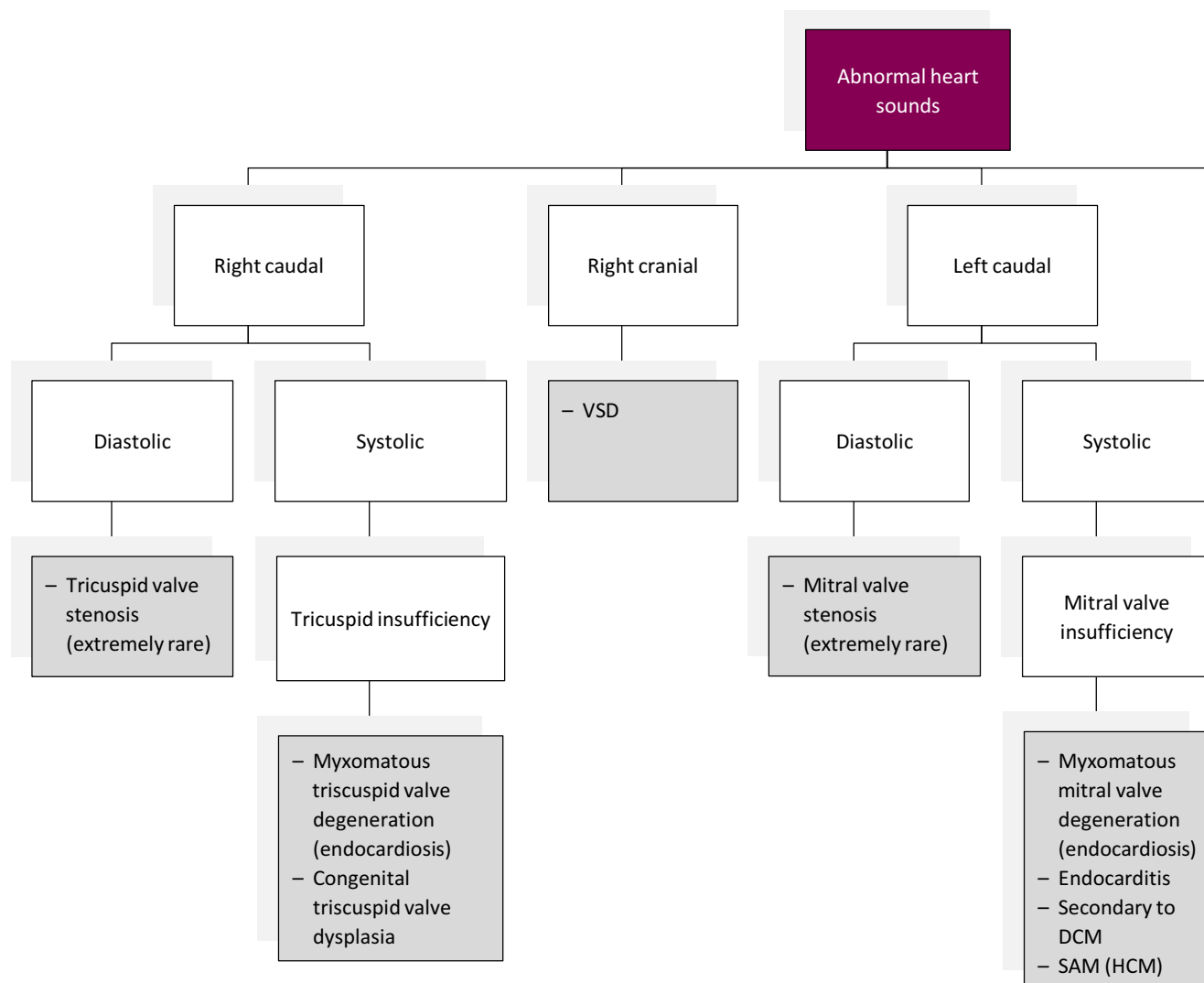


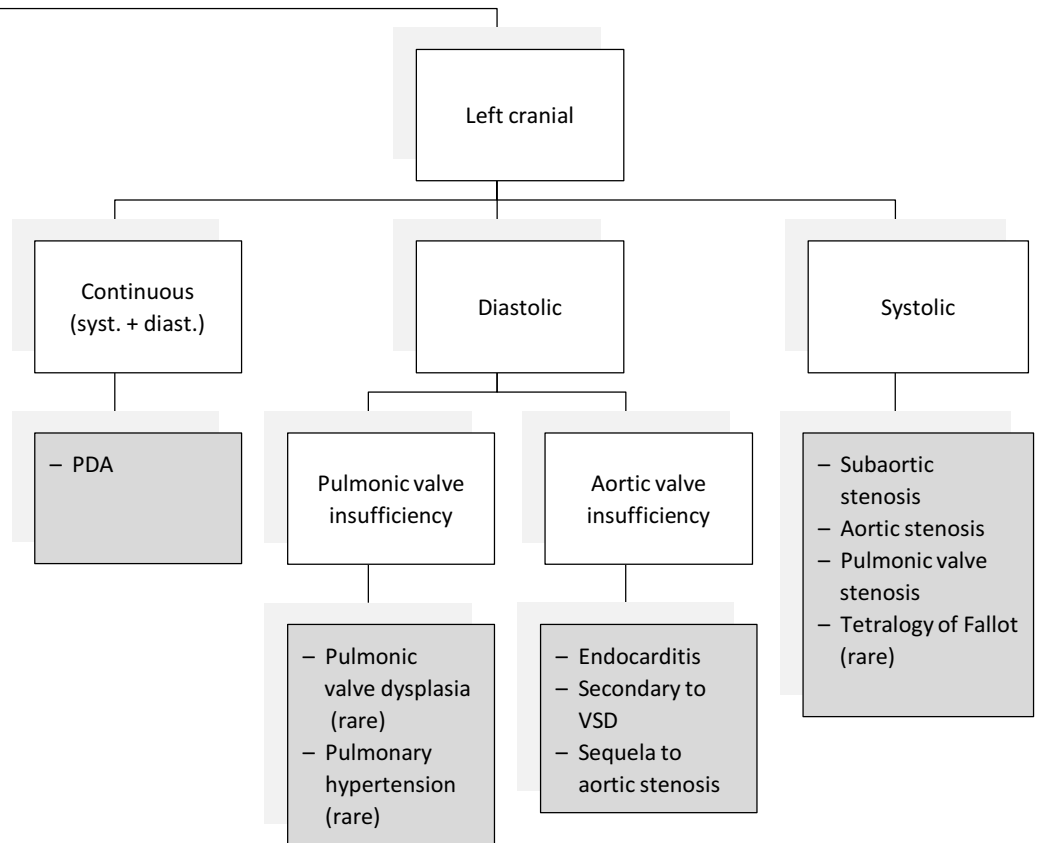
Cardiology

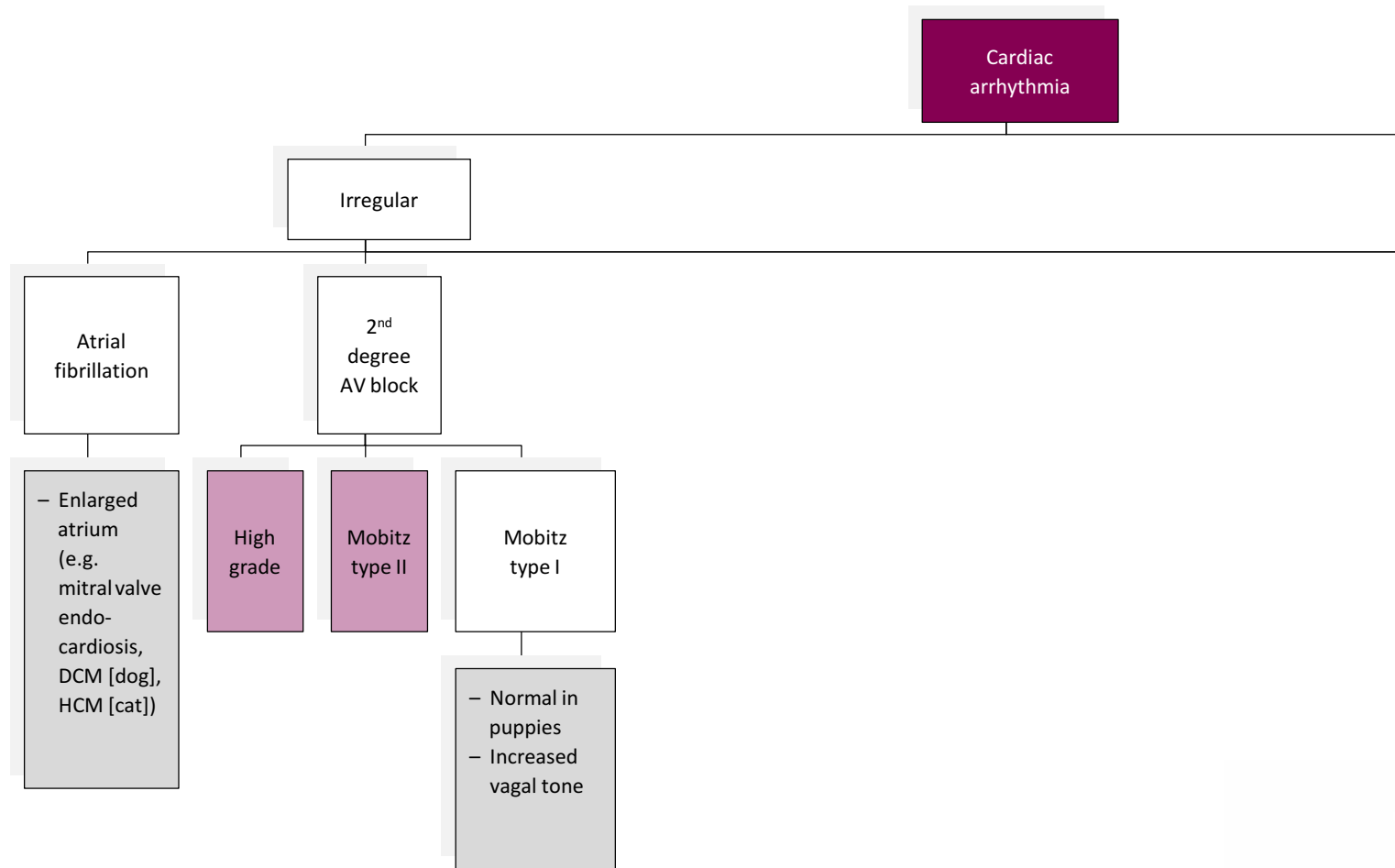


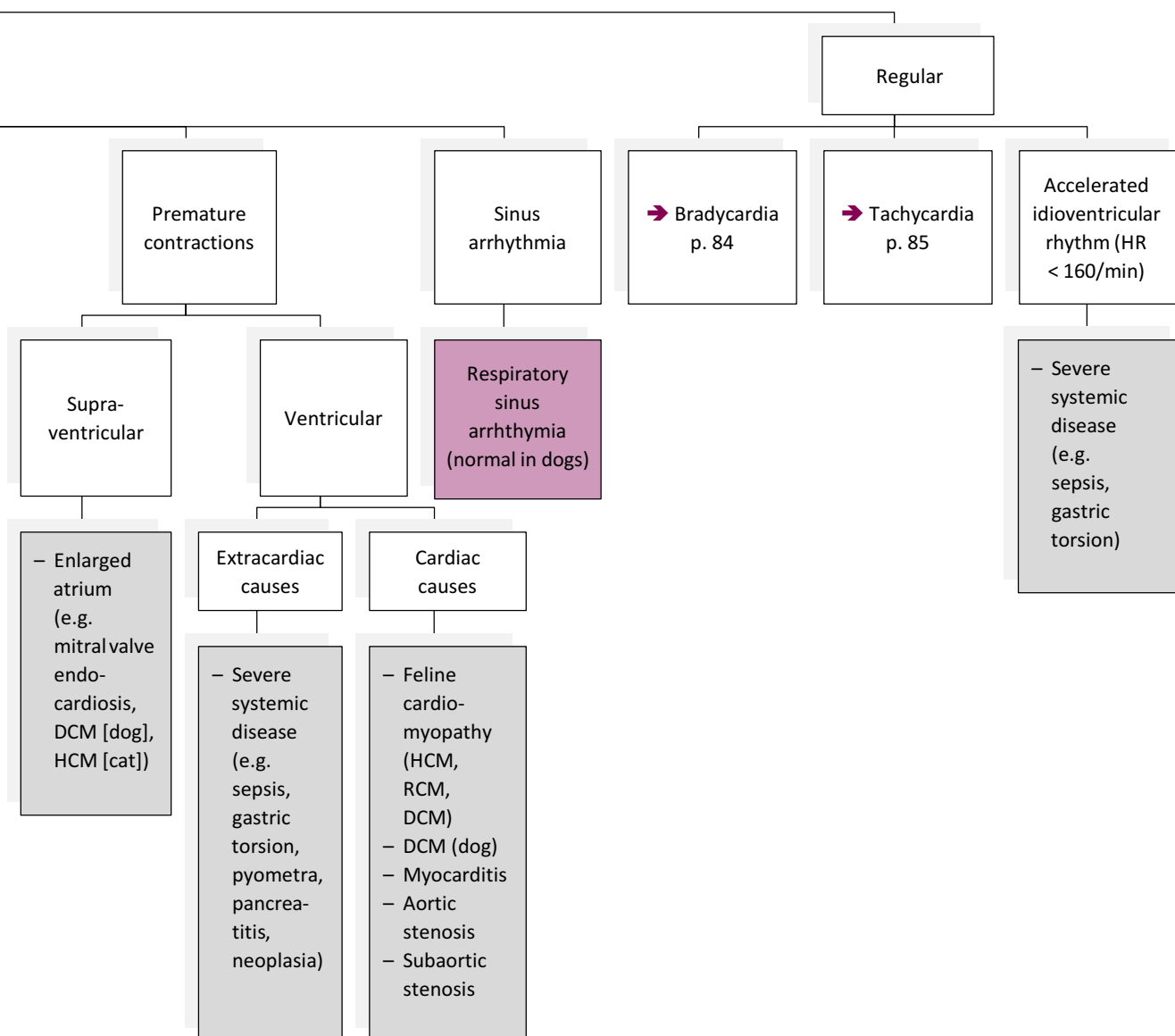


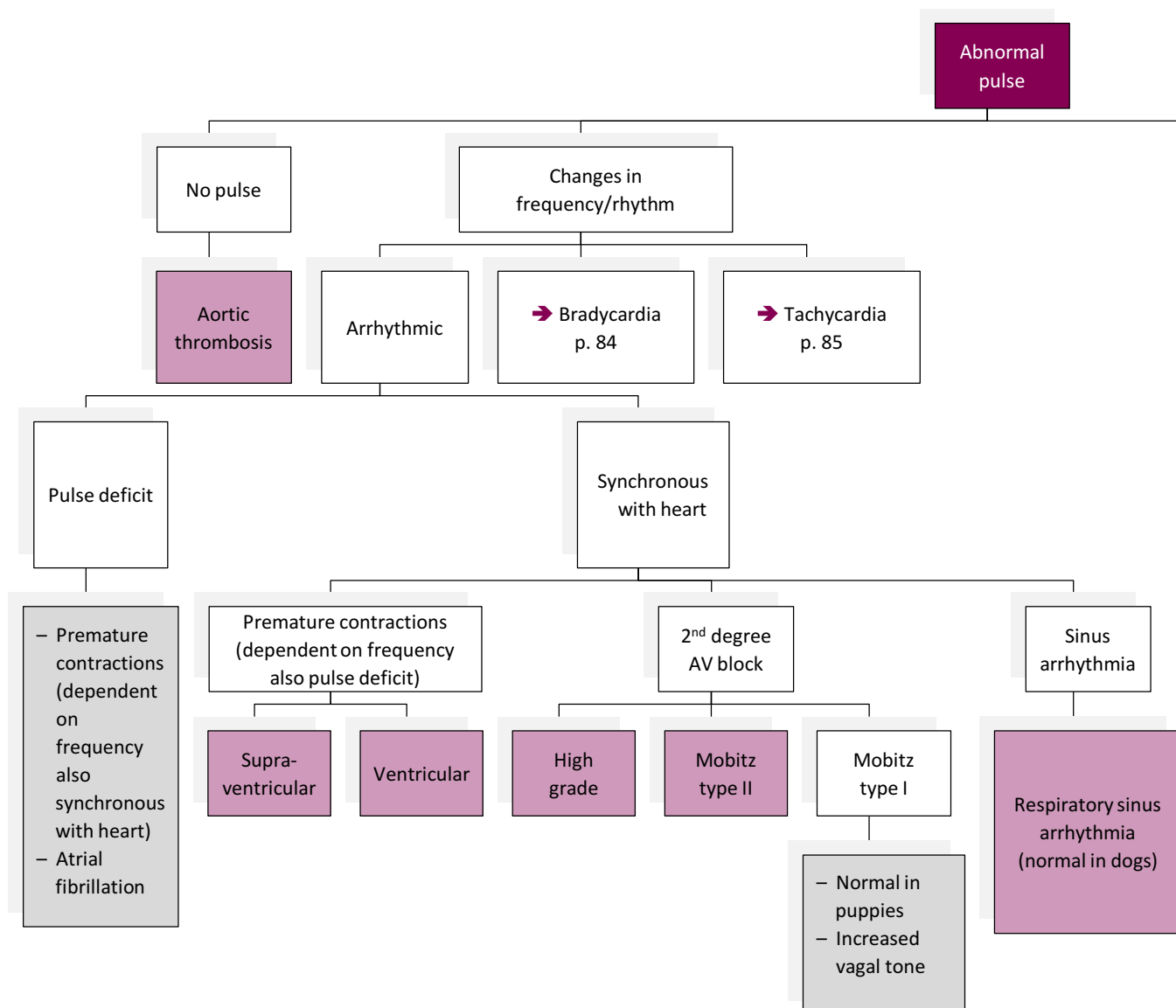


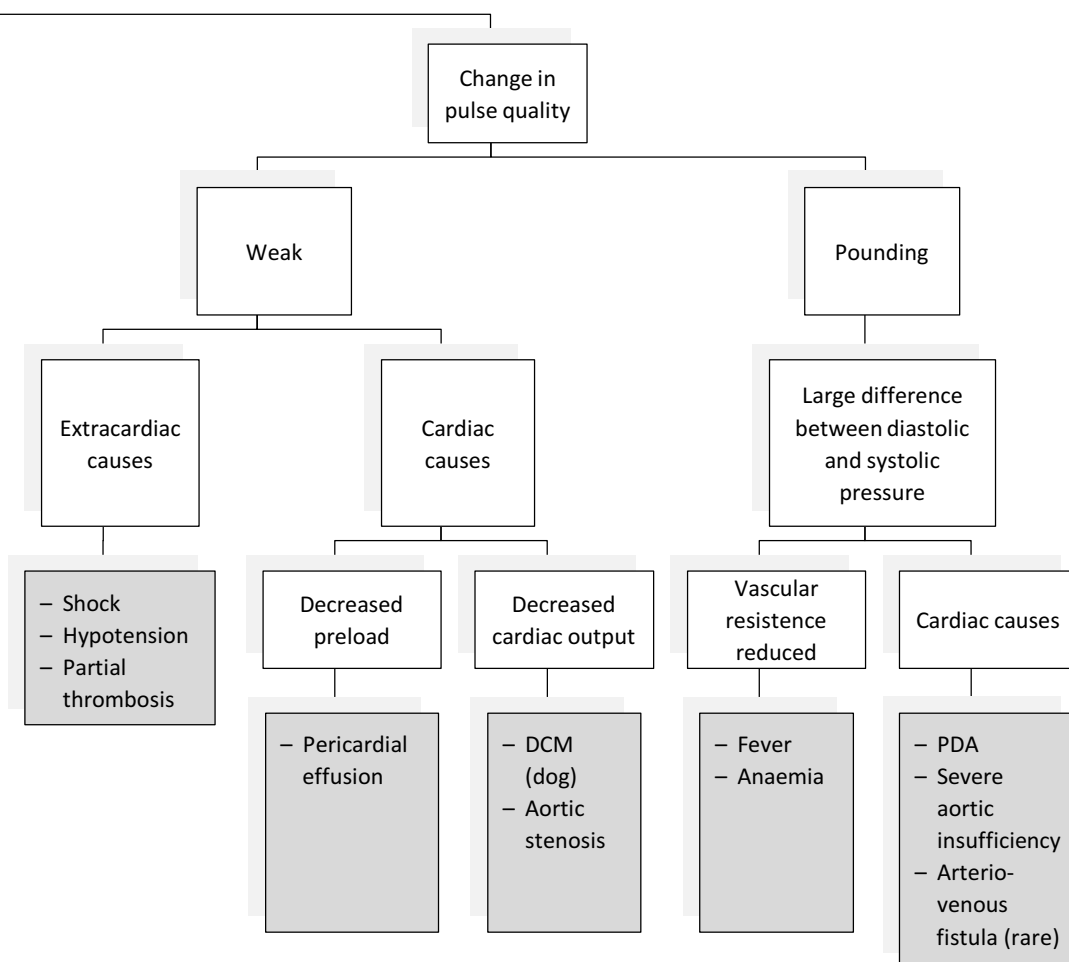


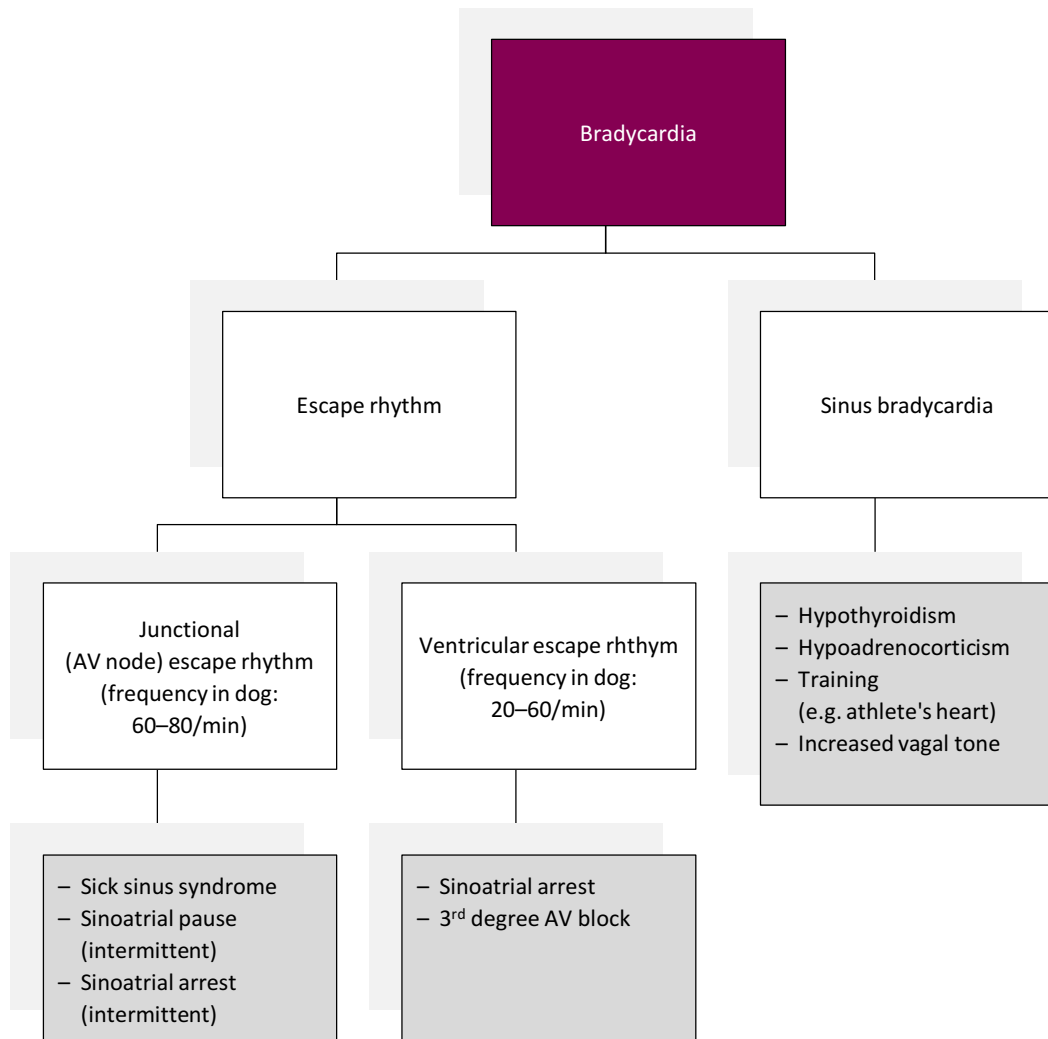


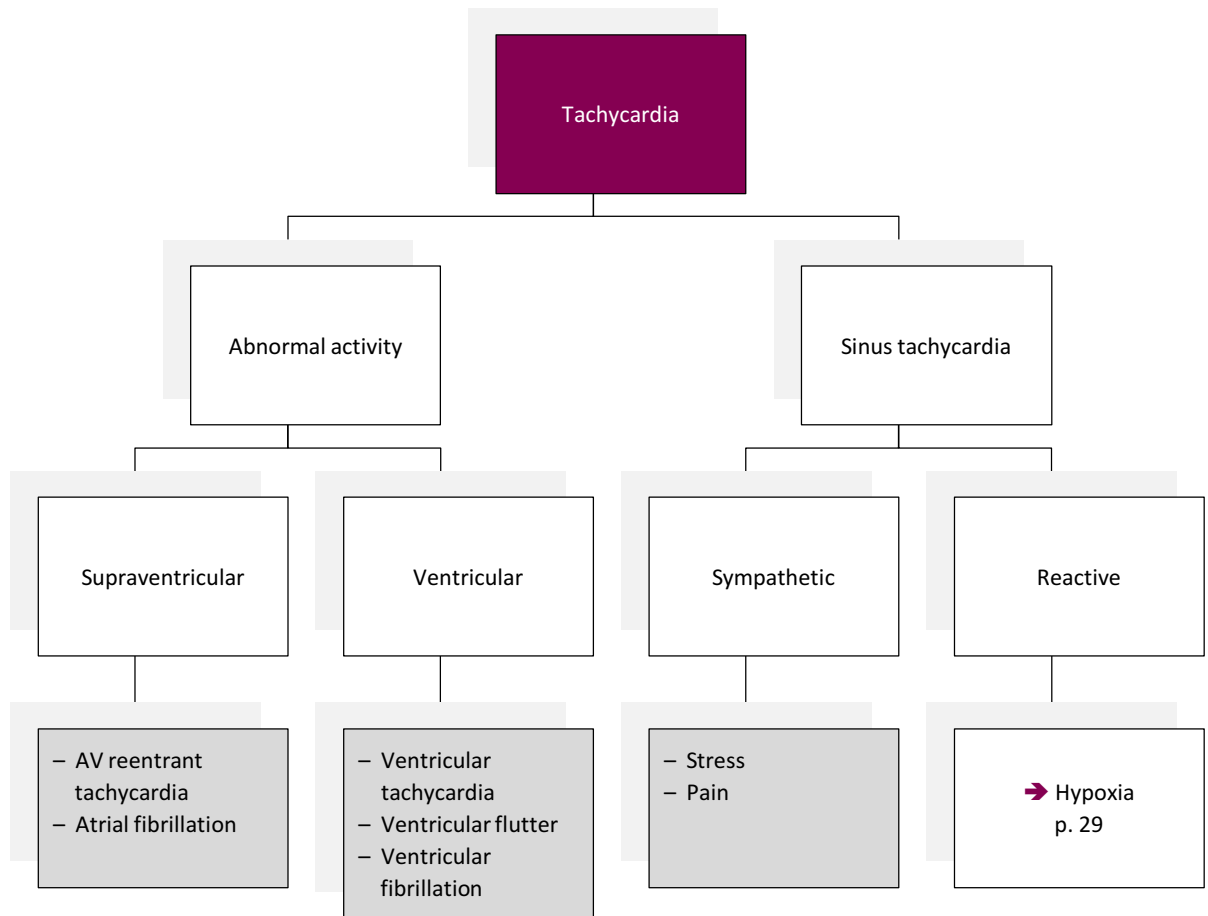




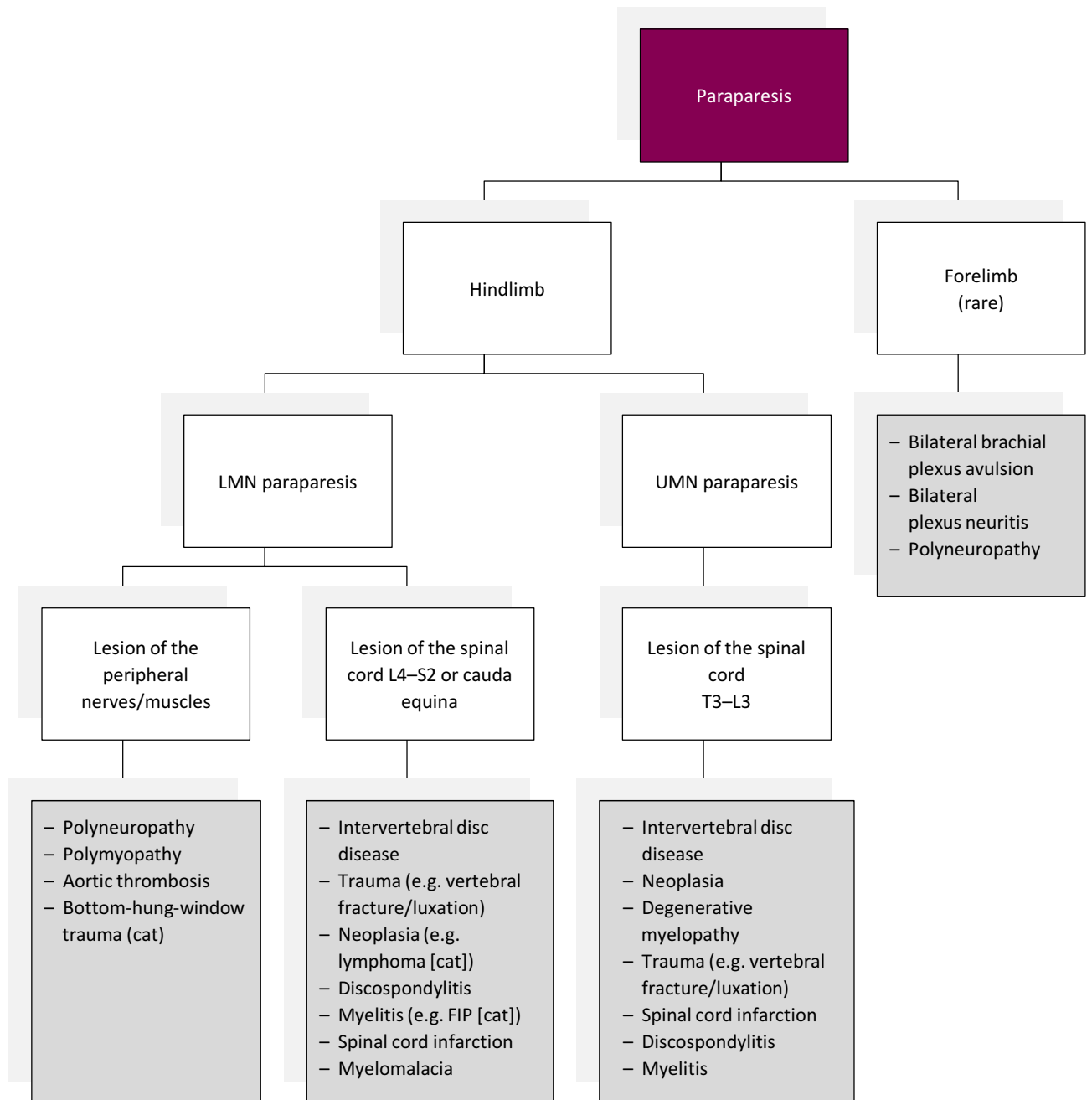


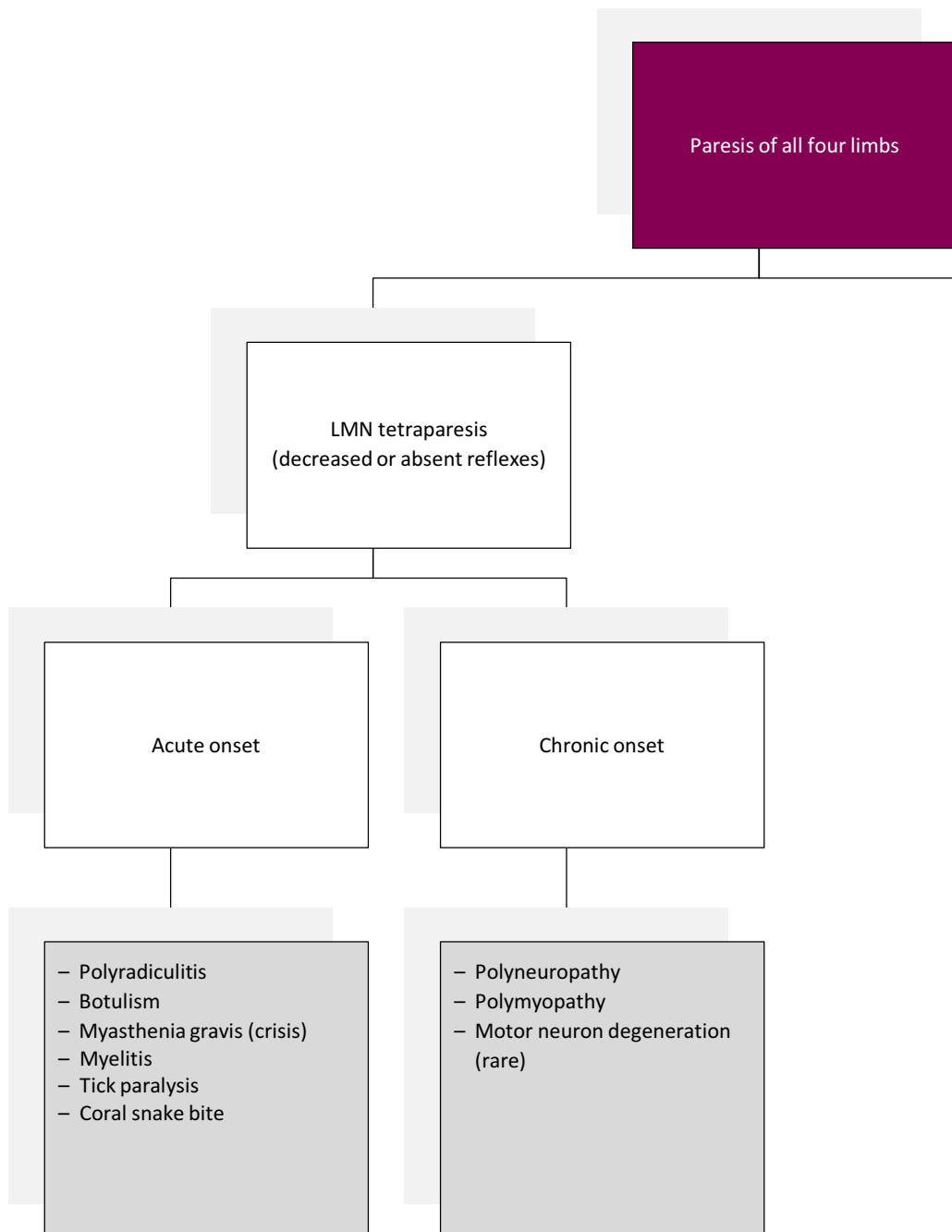


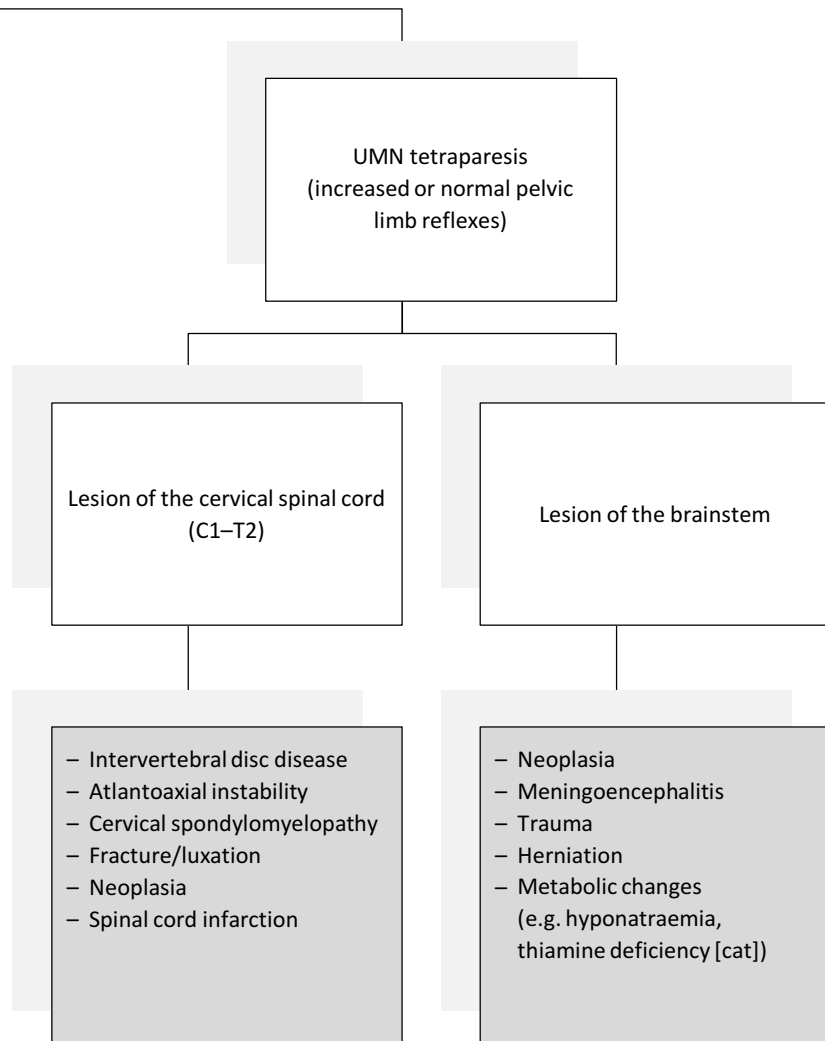


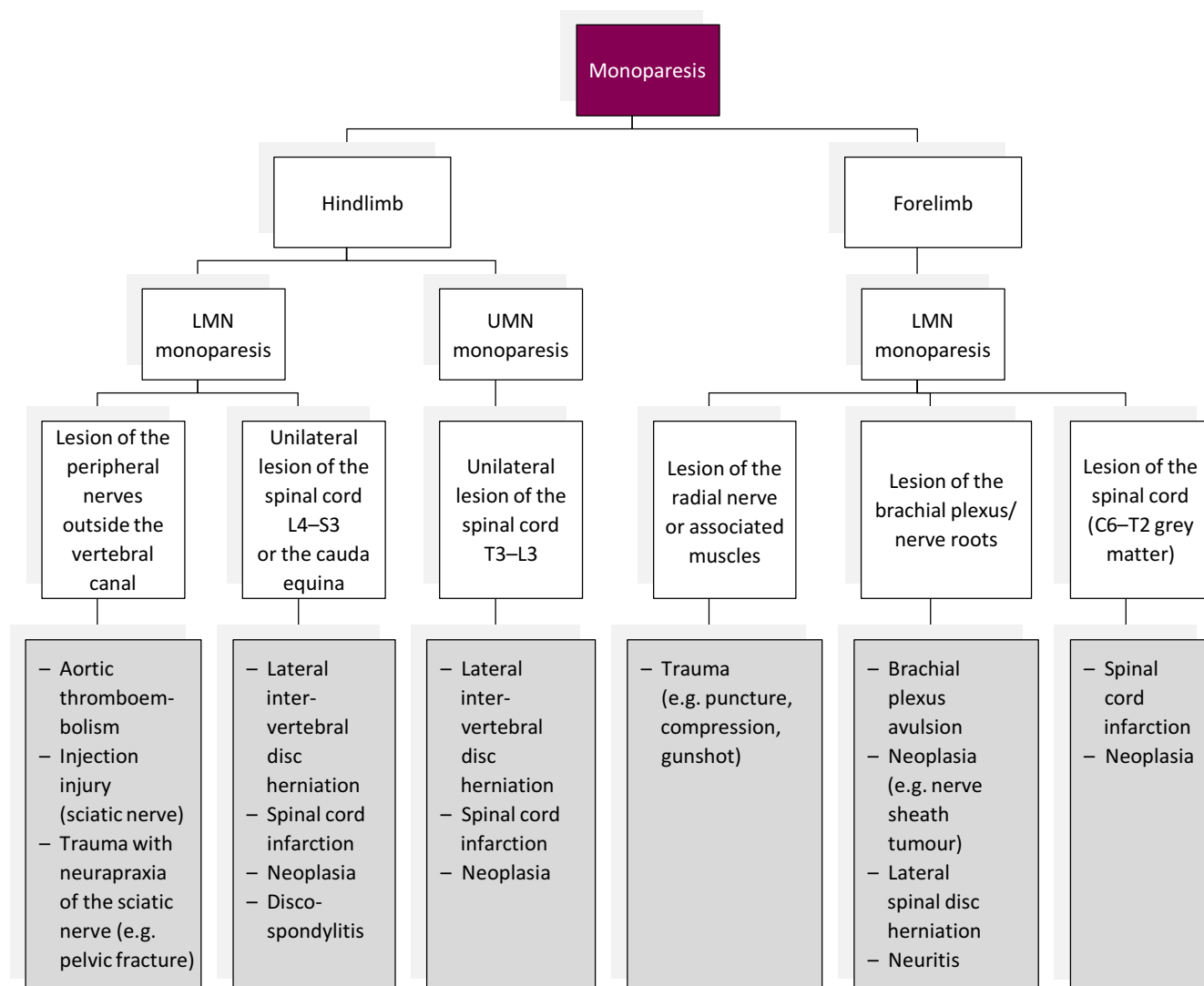


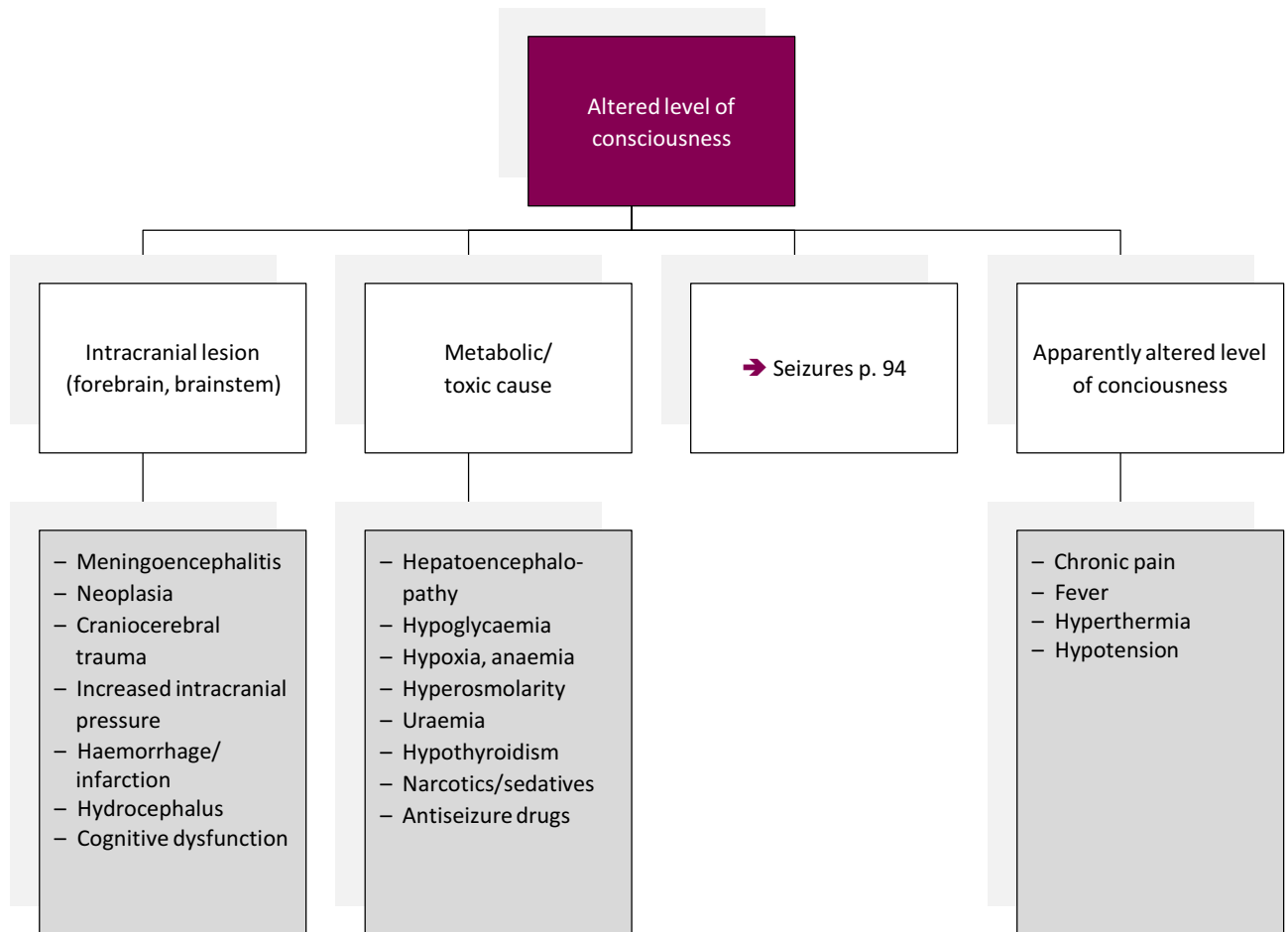
Neurology

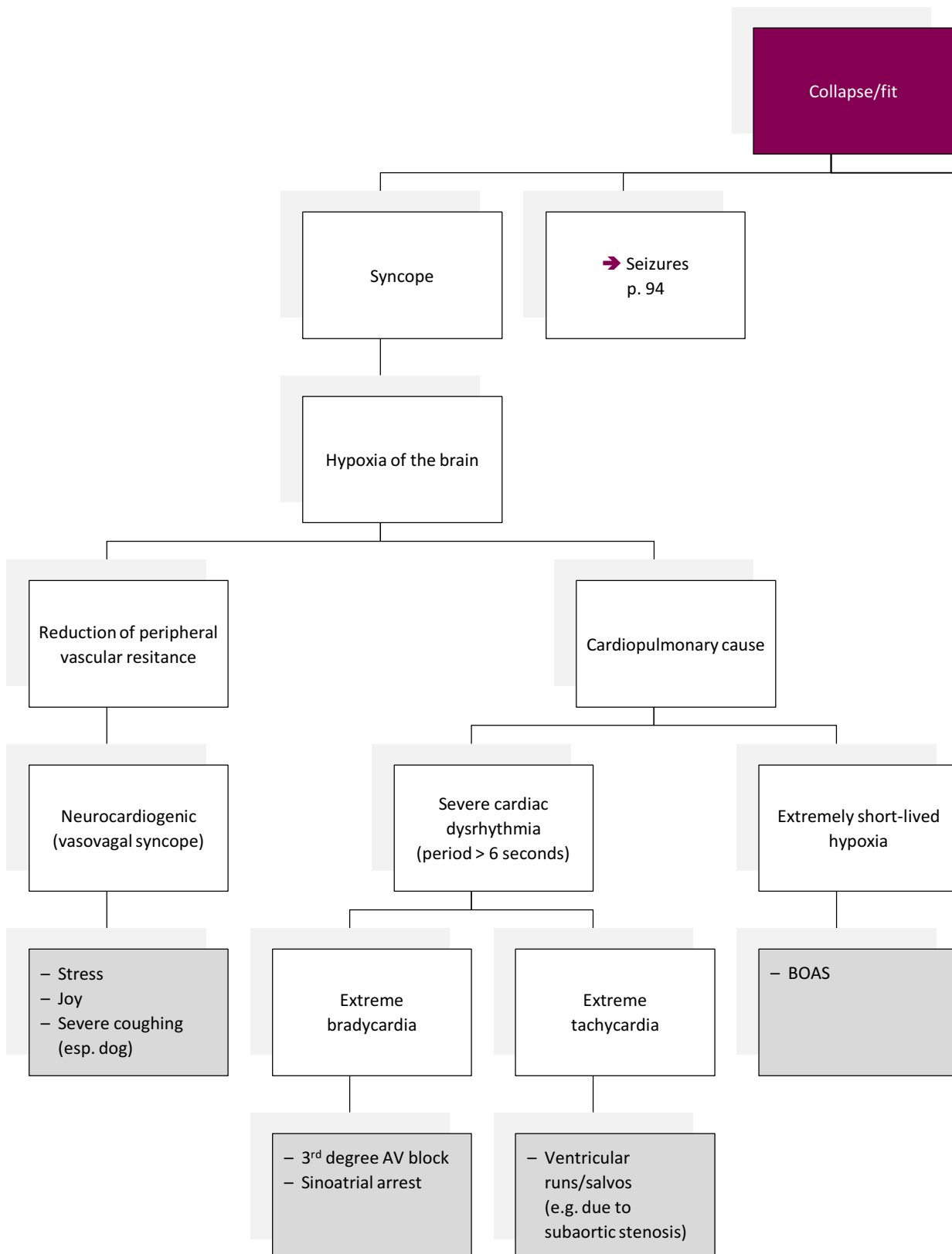


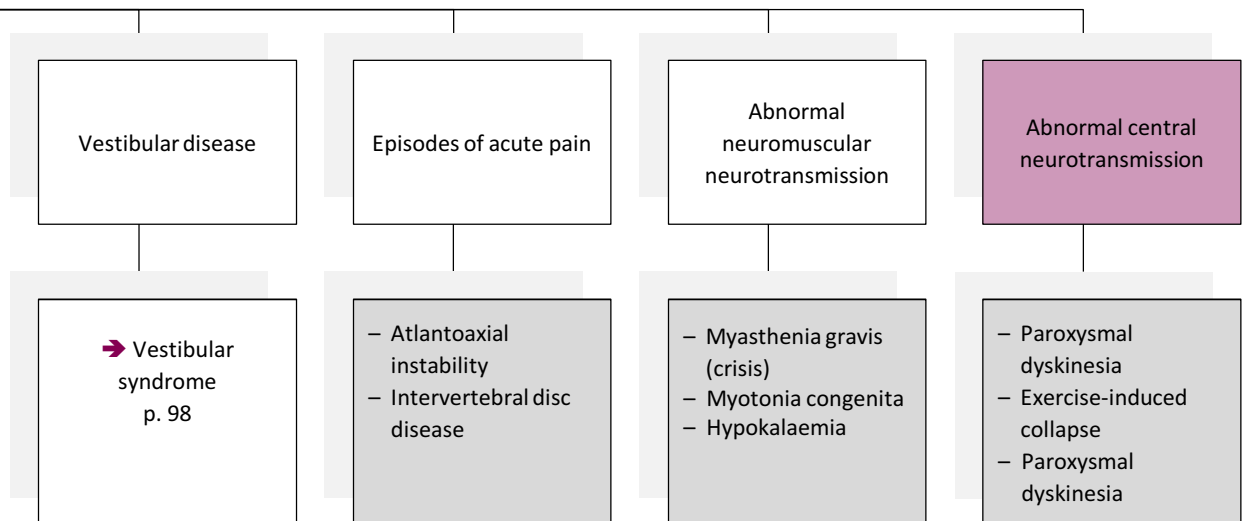


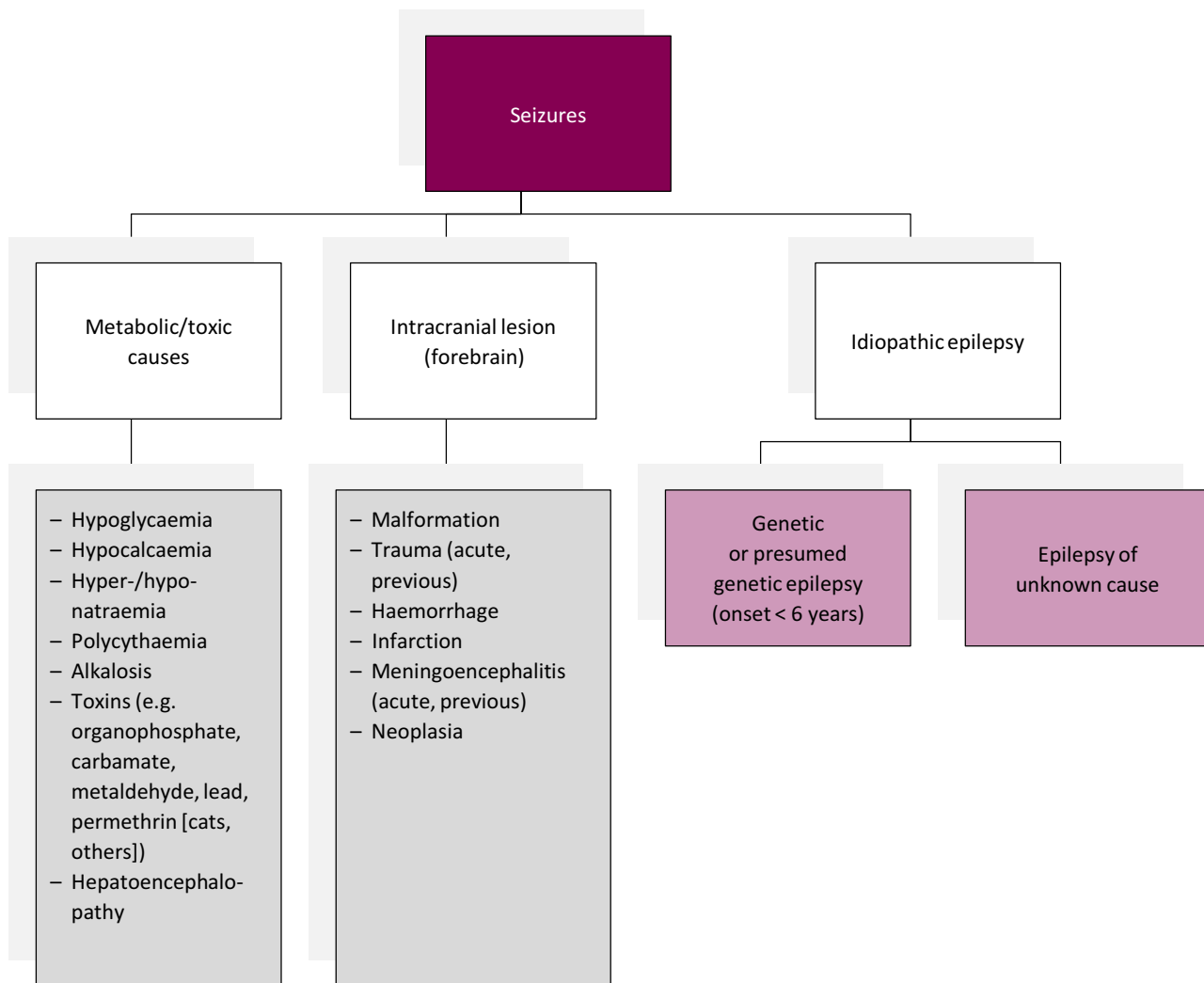


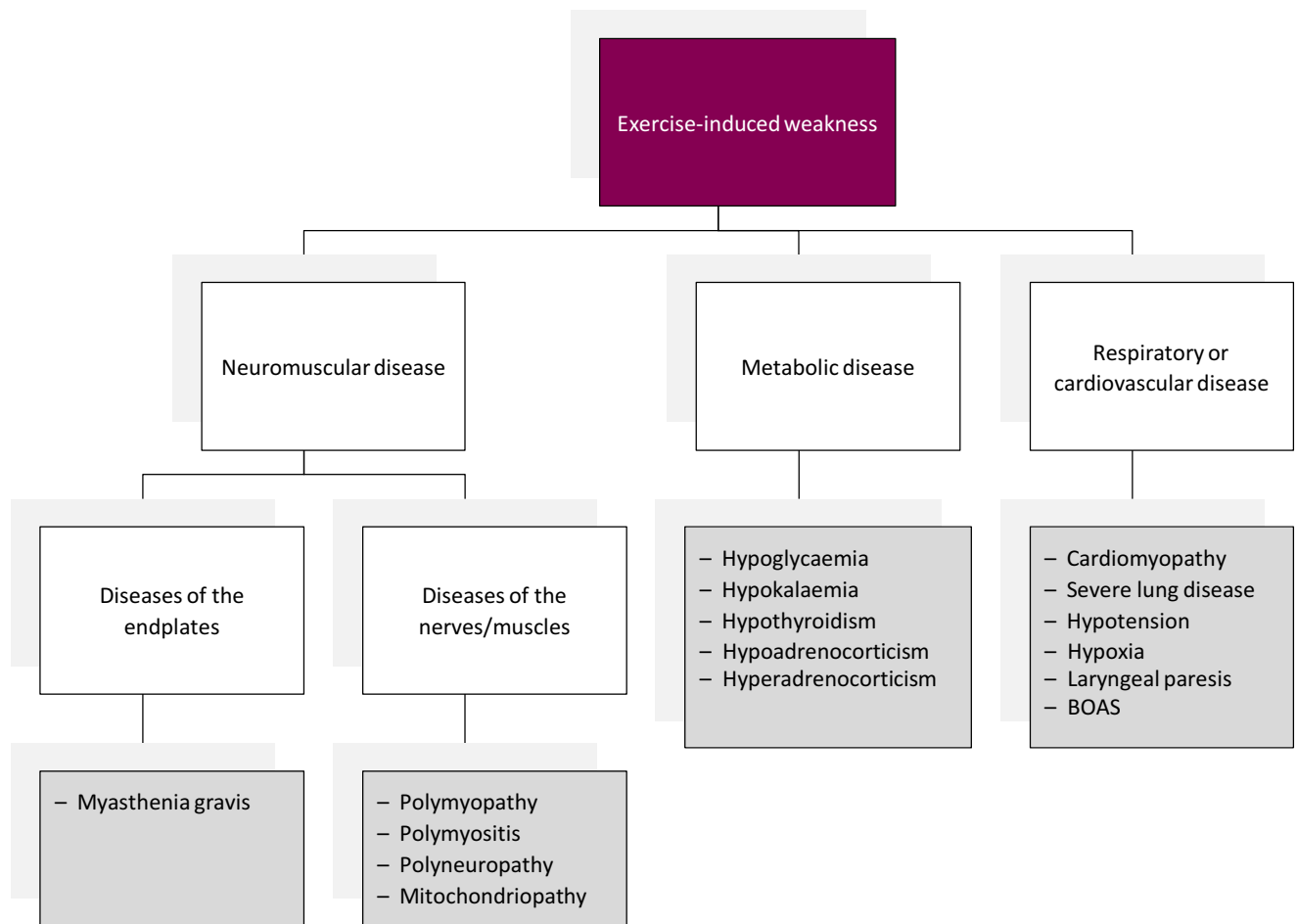


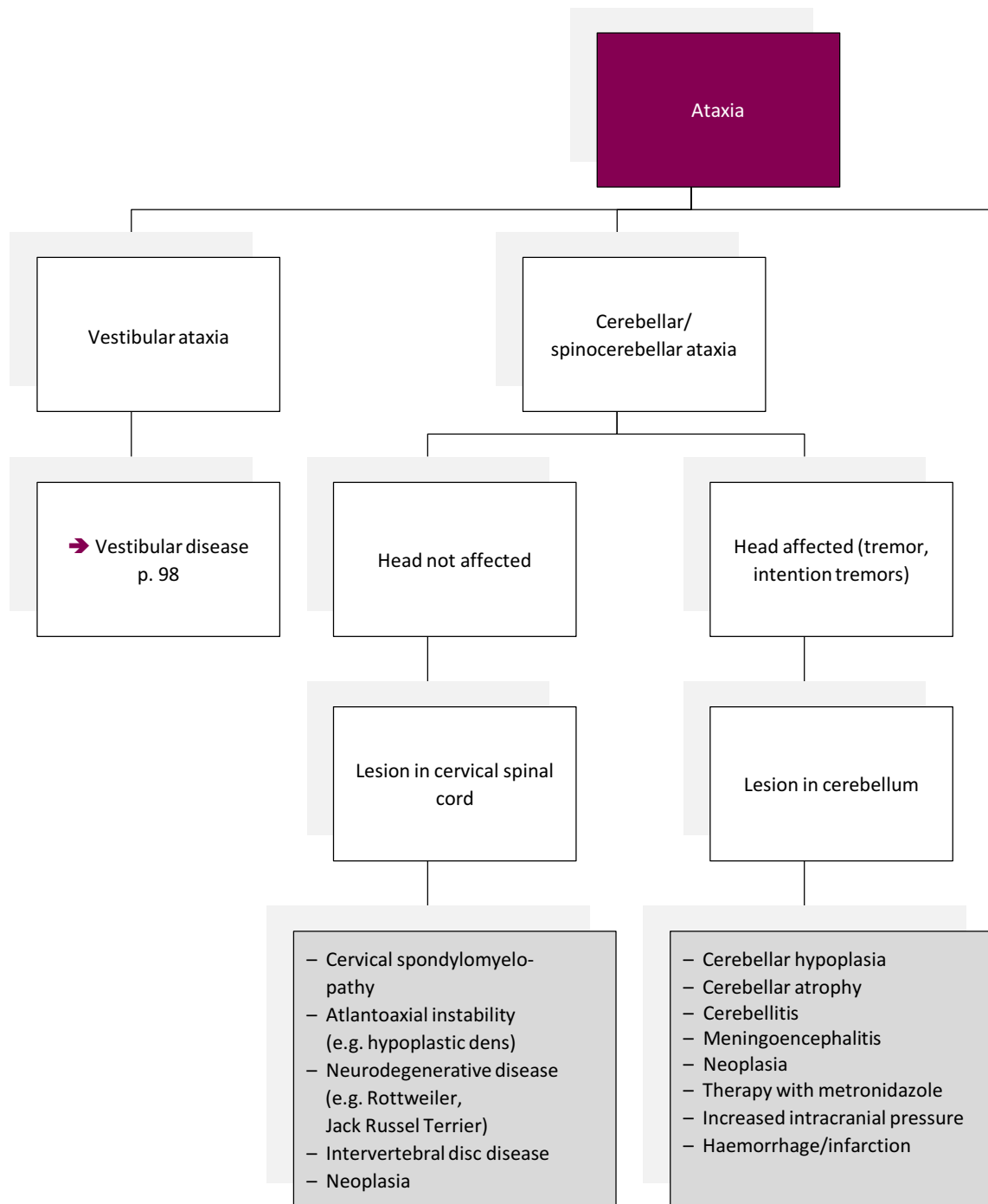


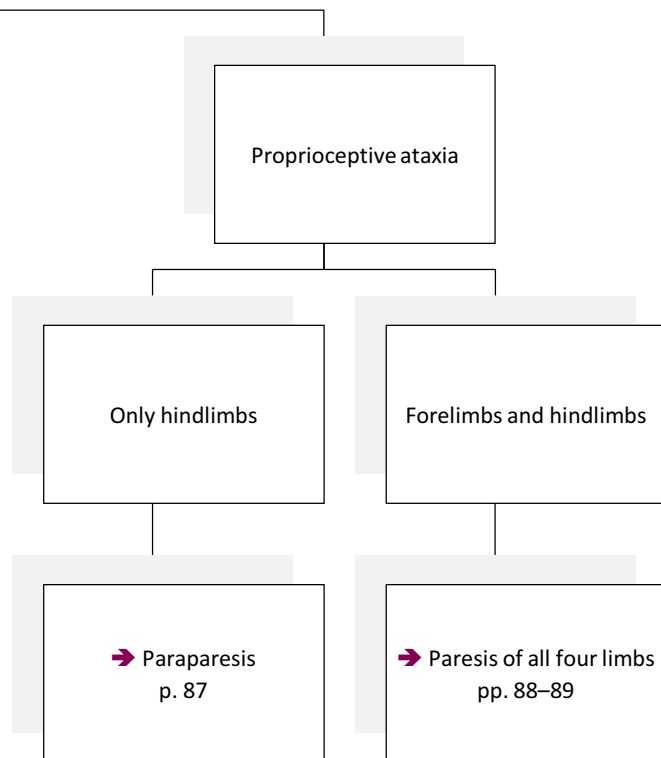


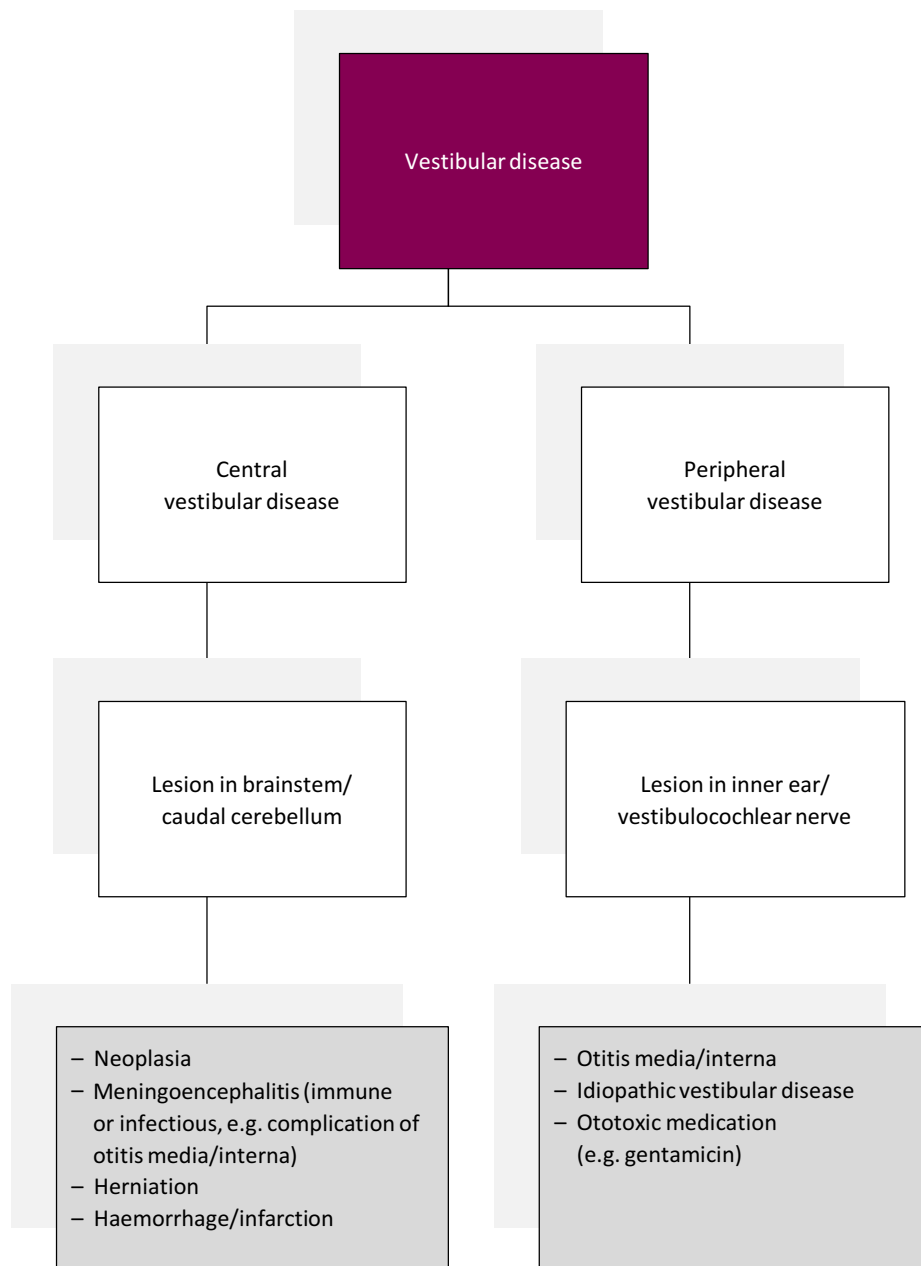


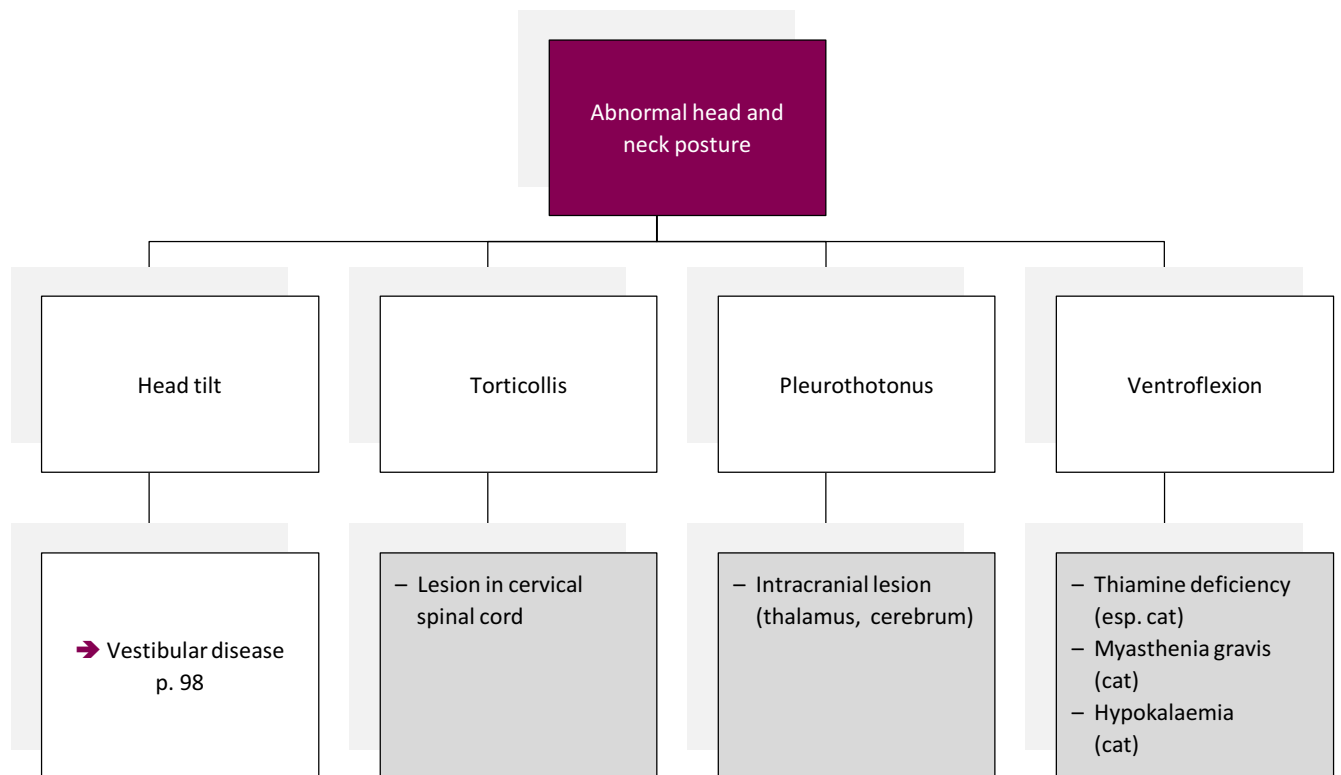


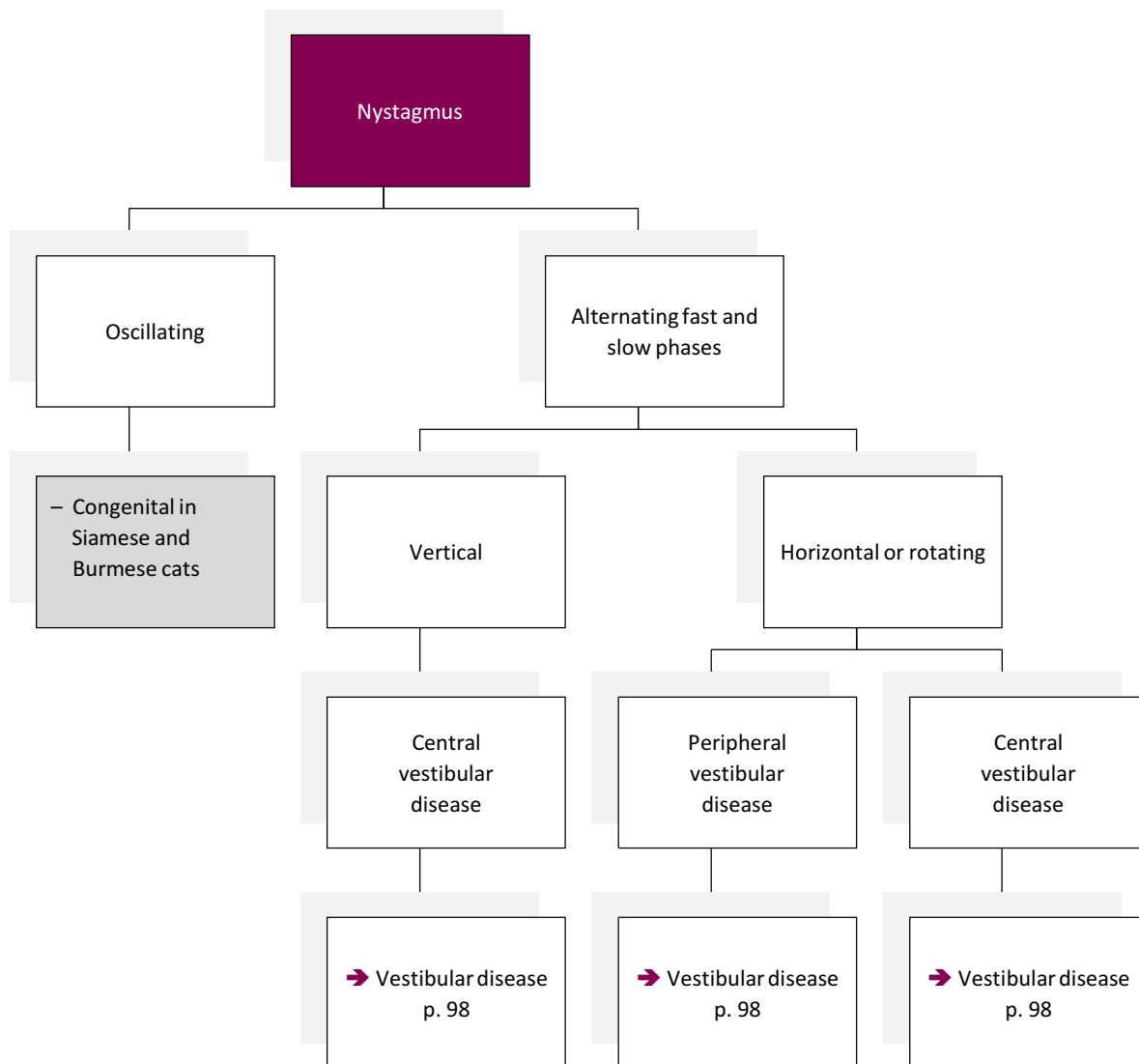


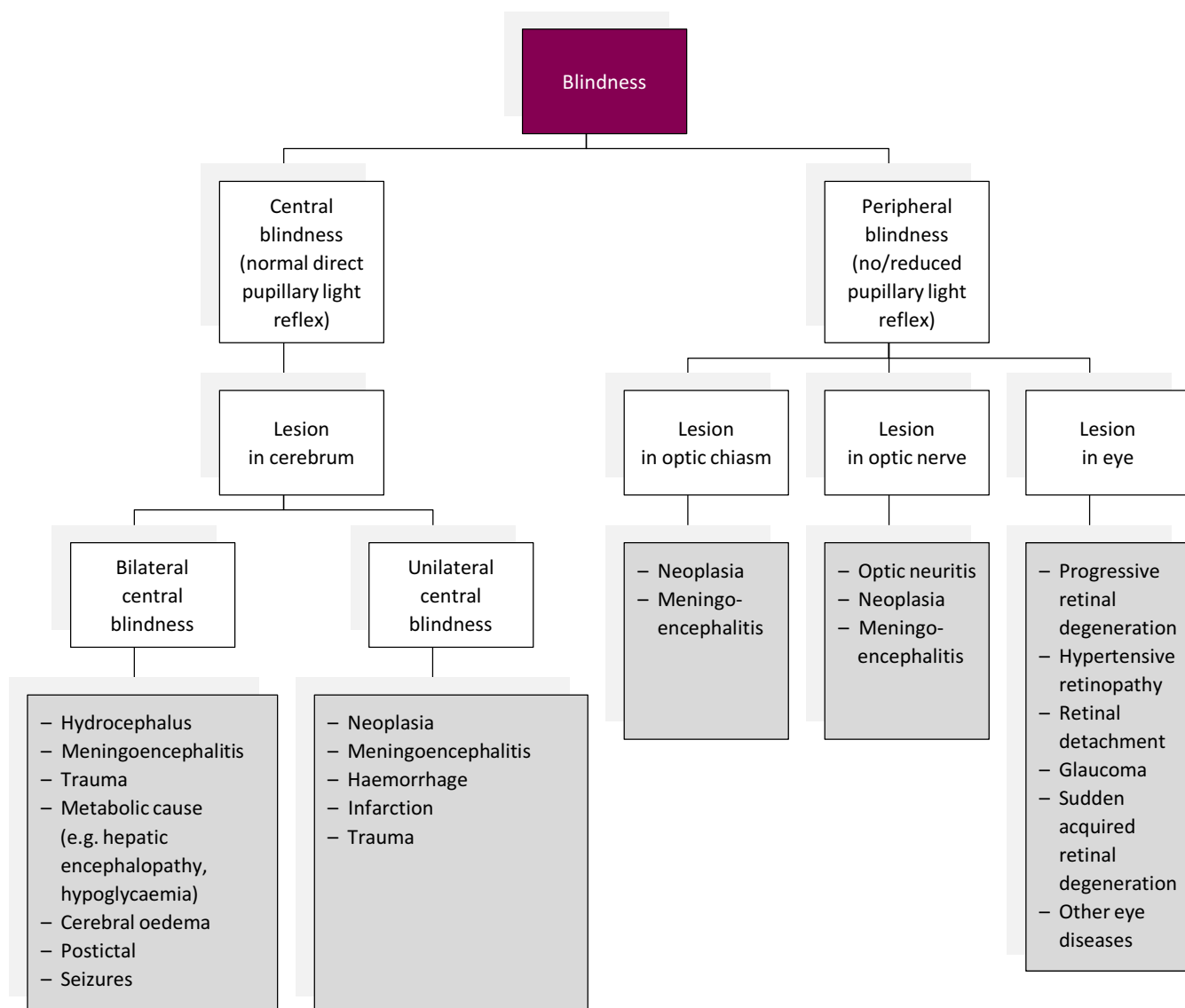


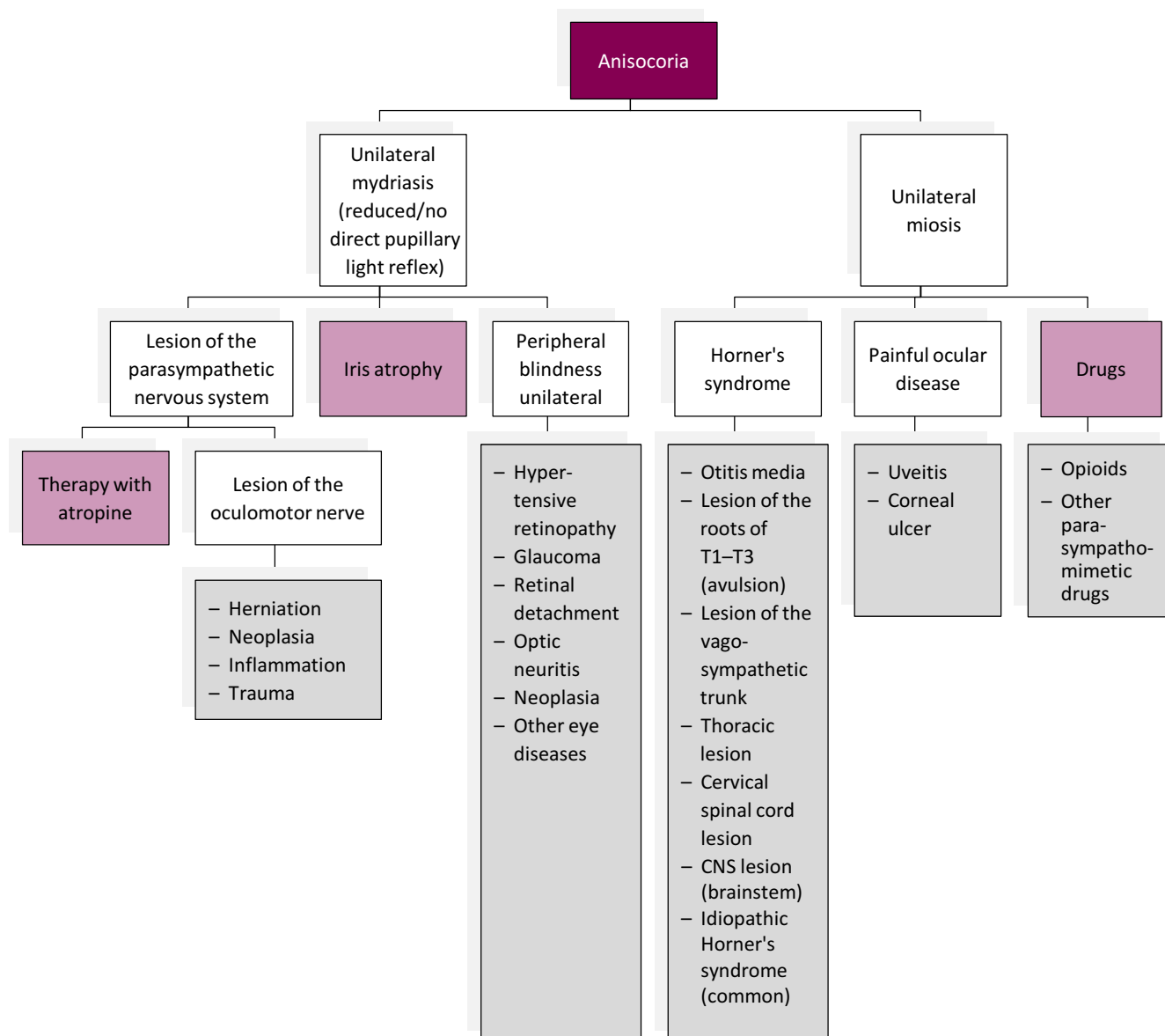


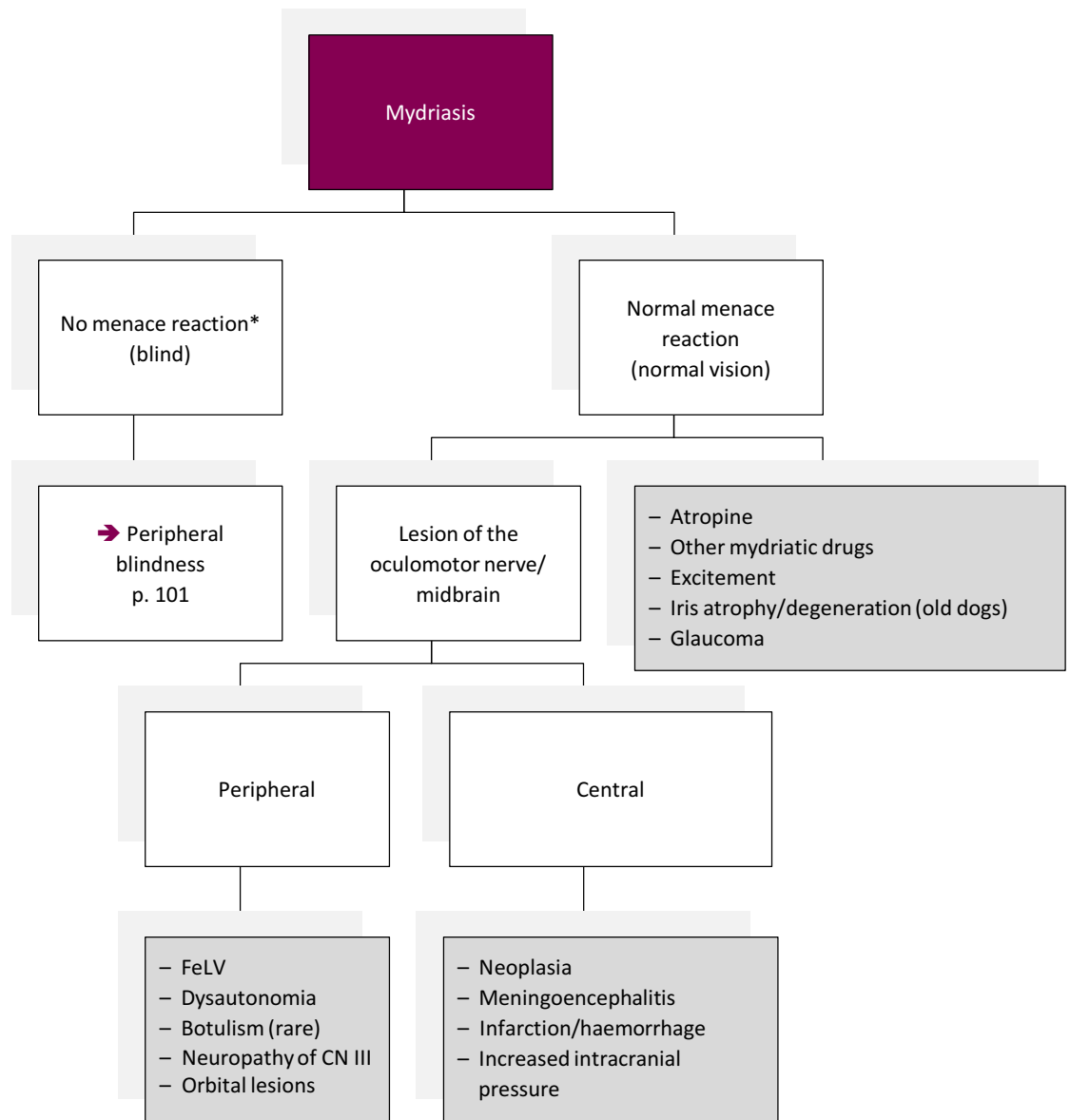




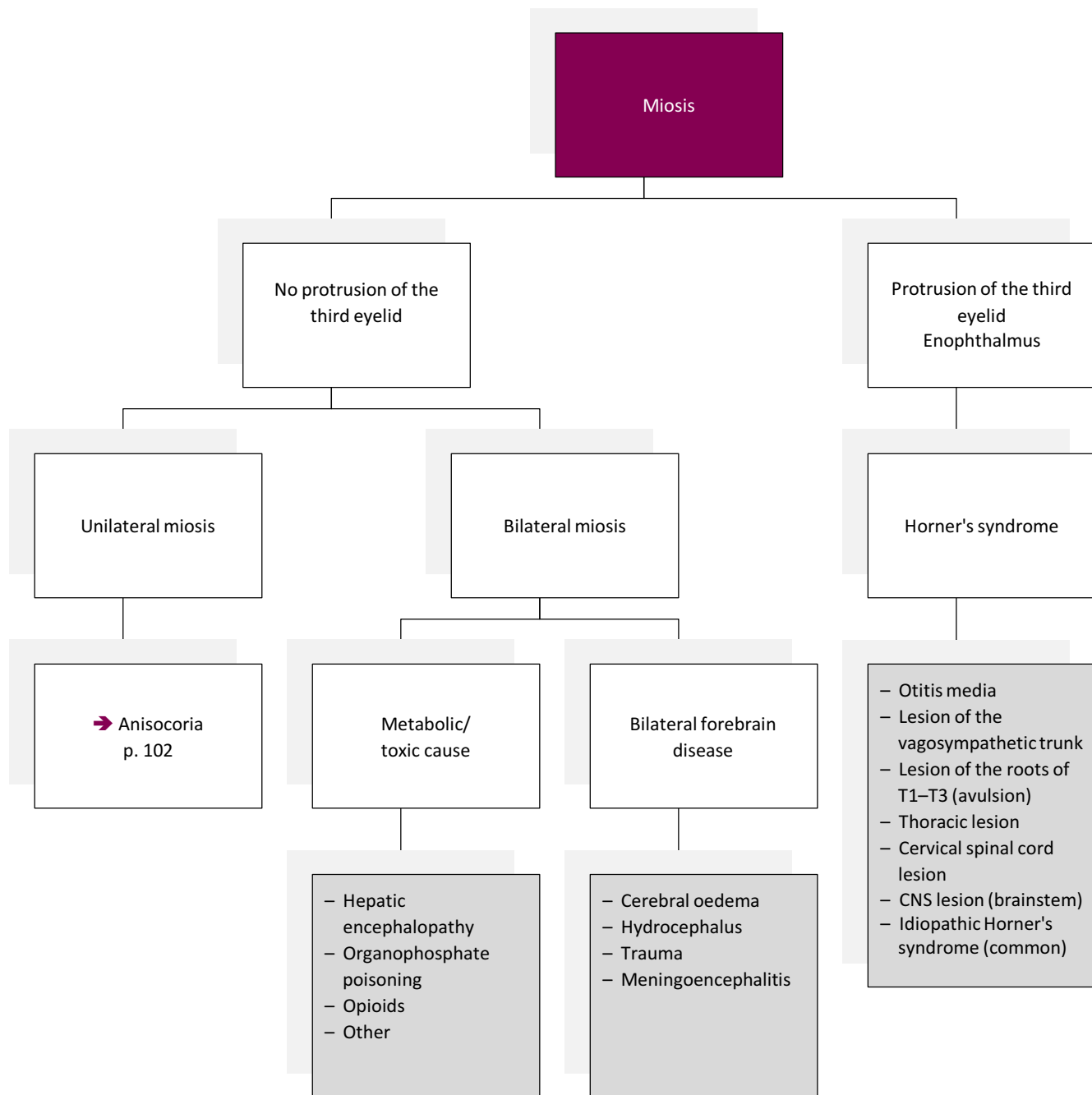


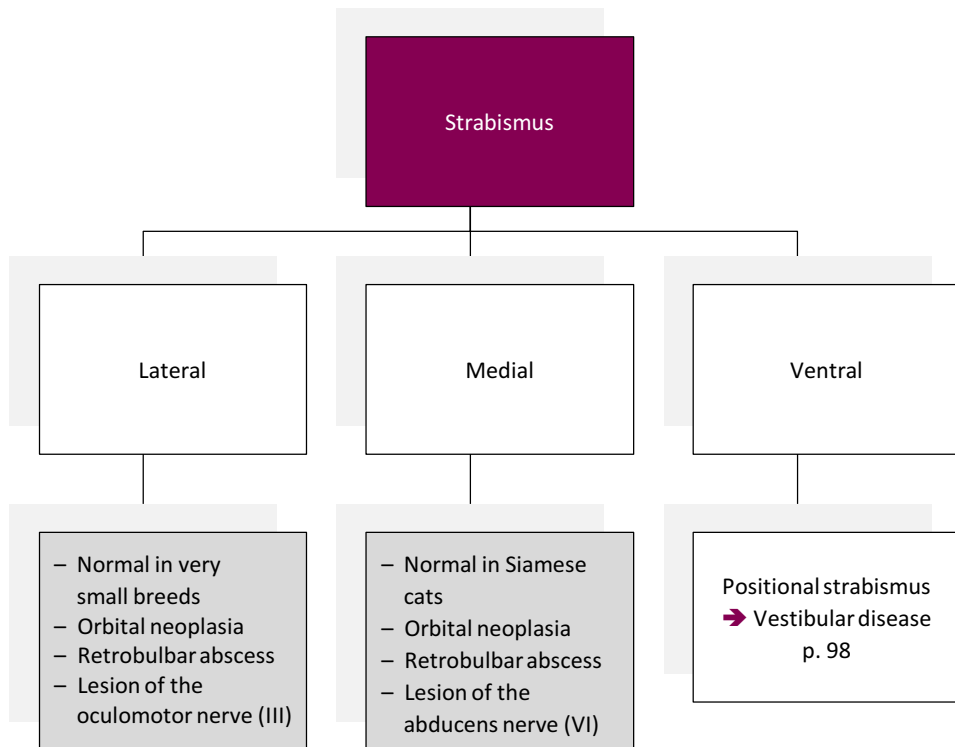


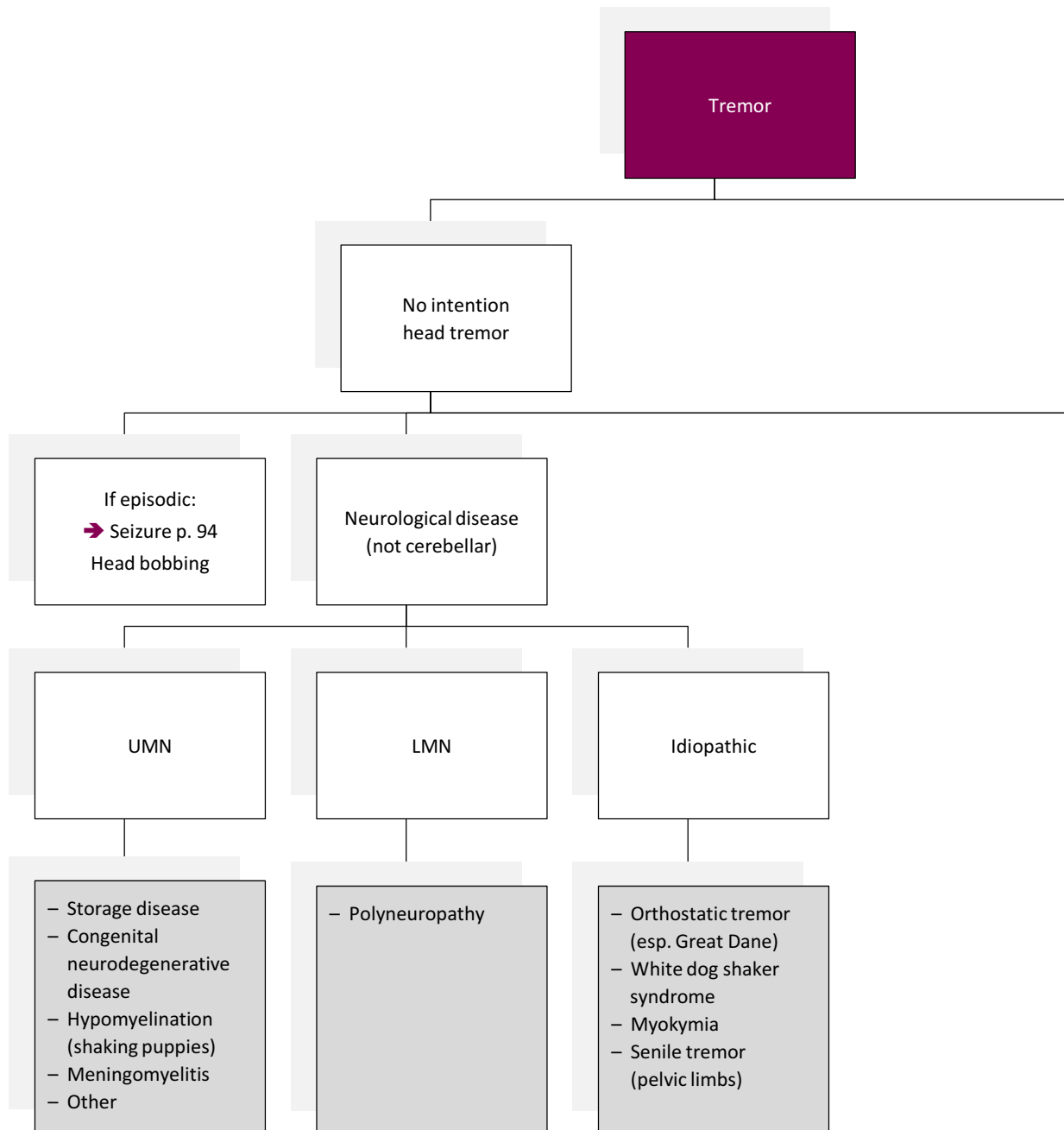


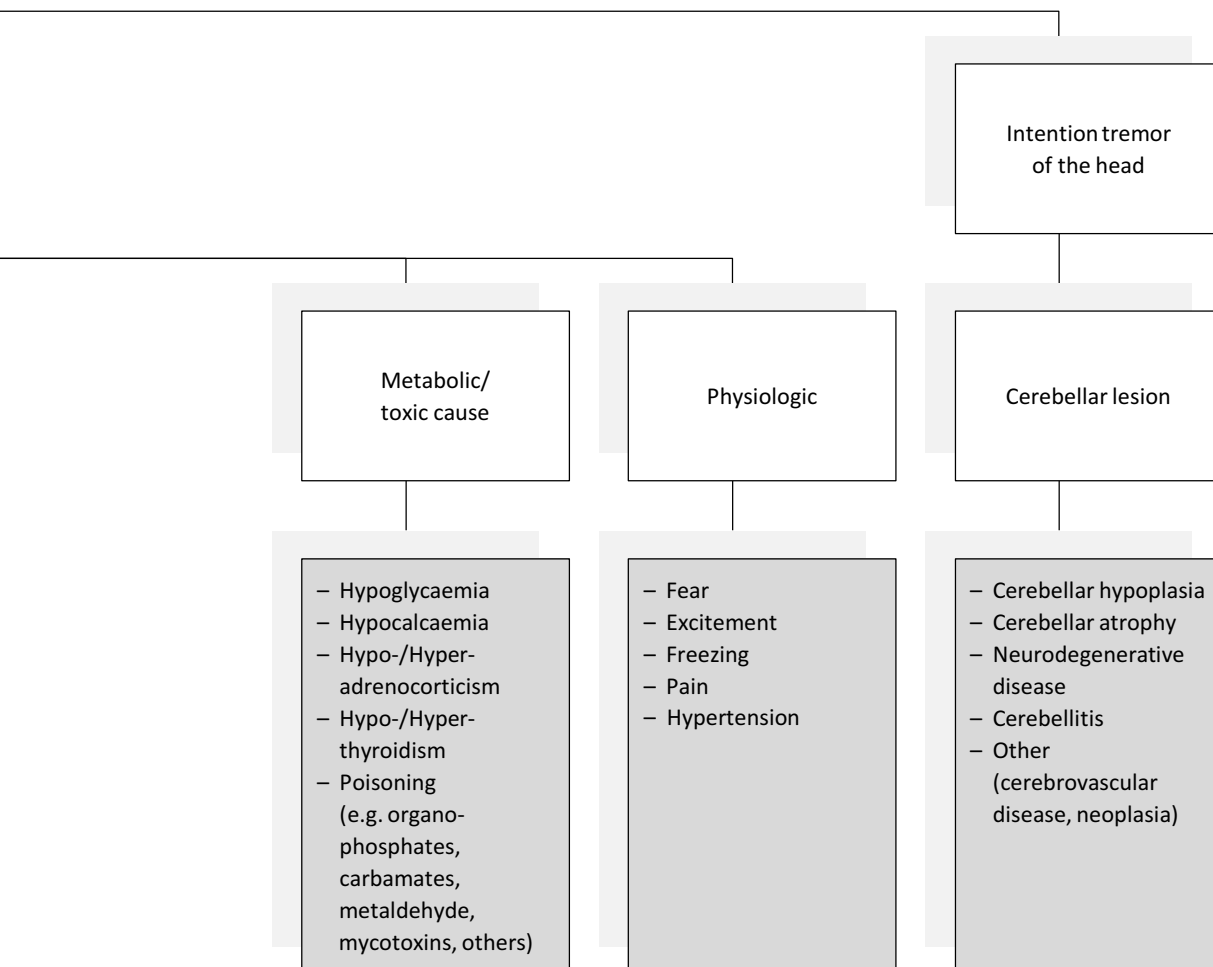


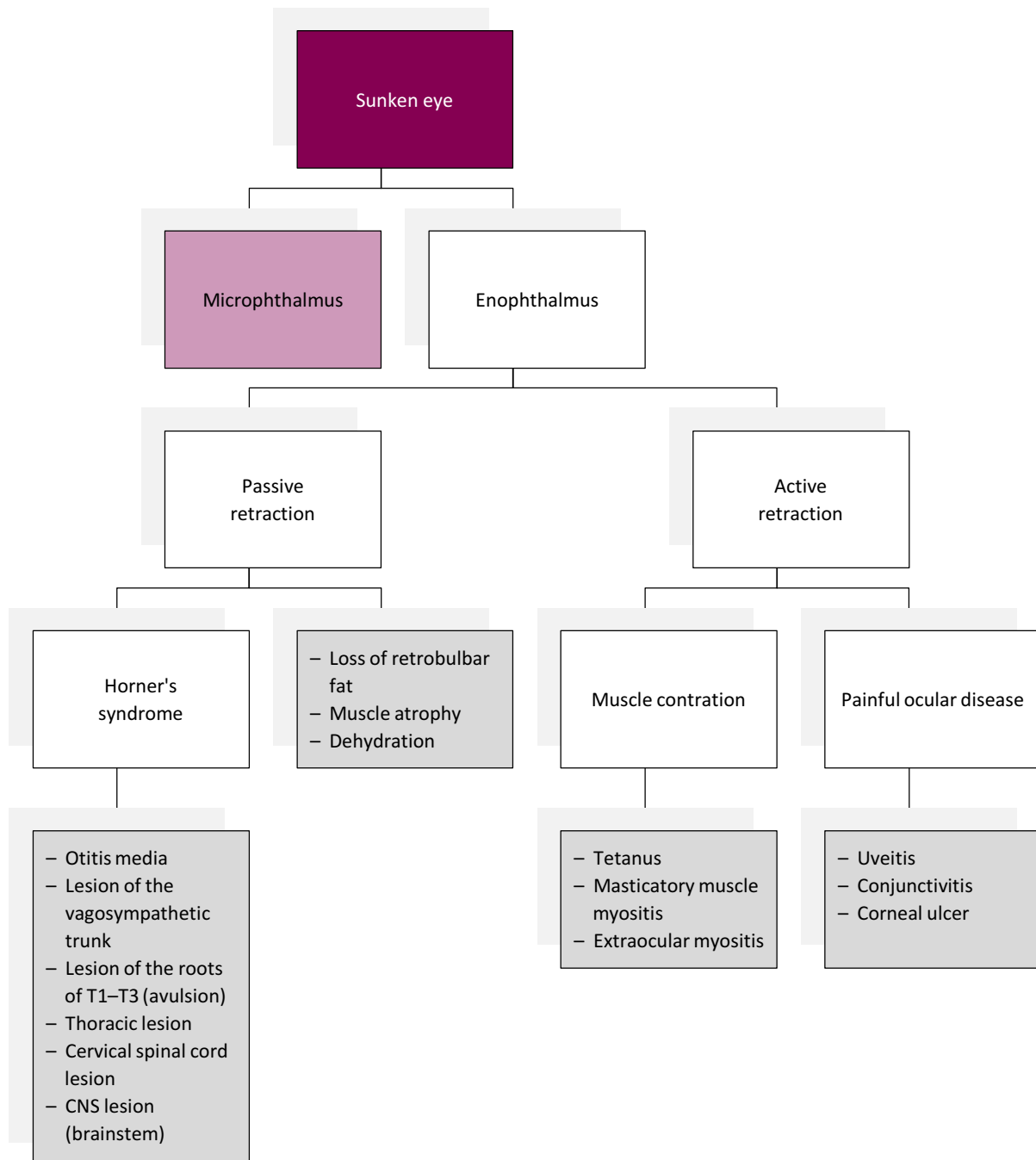
* Menace reaction is physiologically absent in dogs ≤ 12 weeks of age



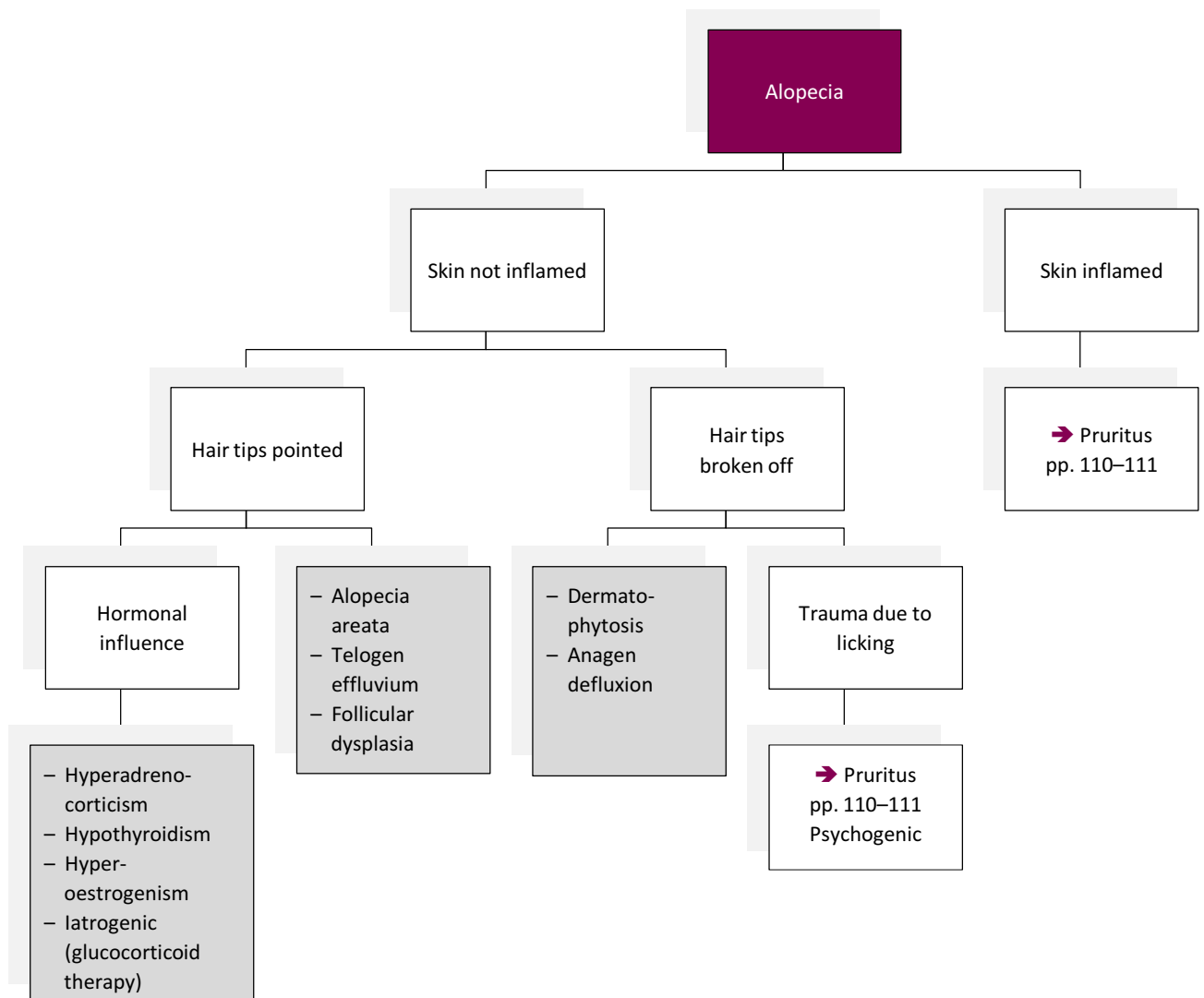


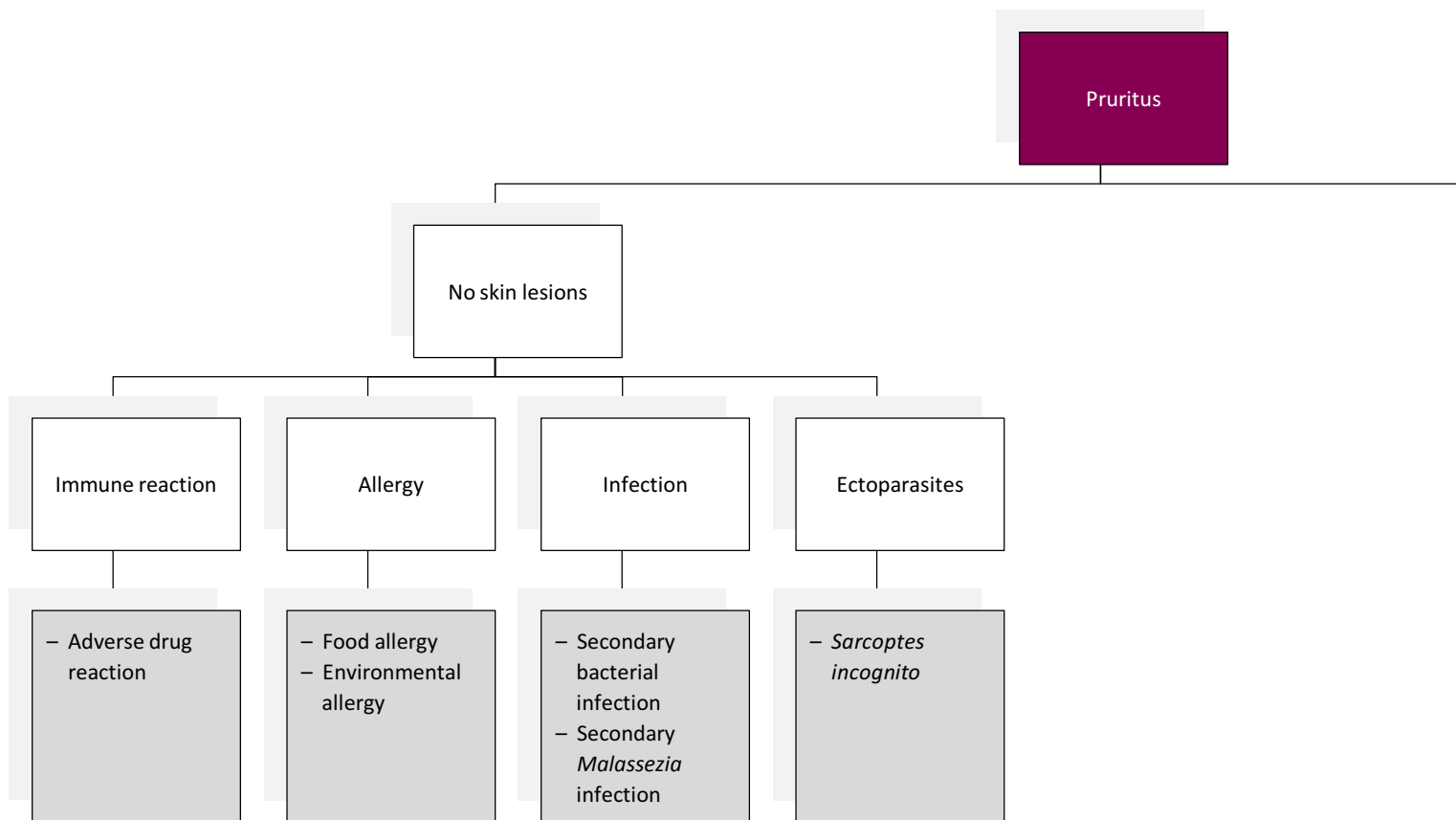


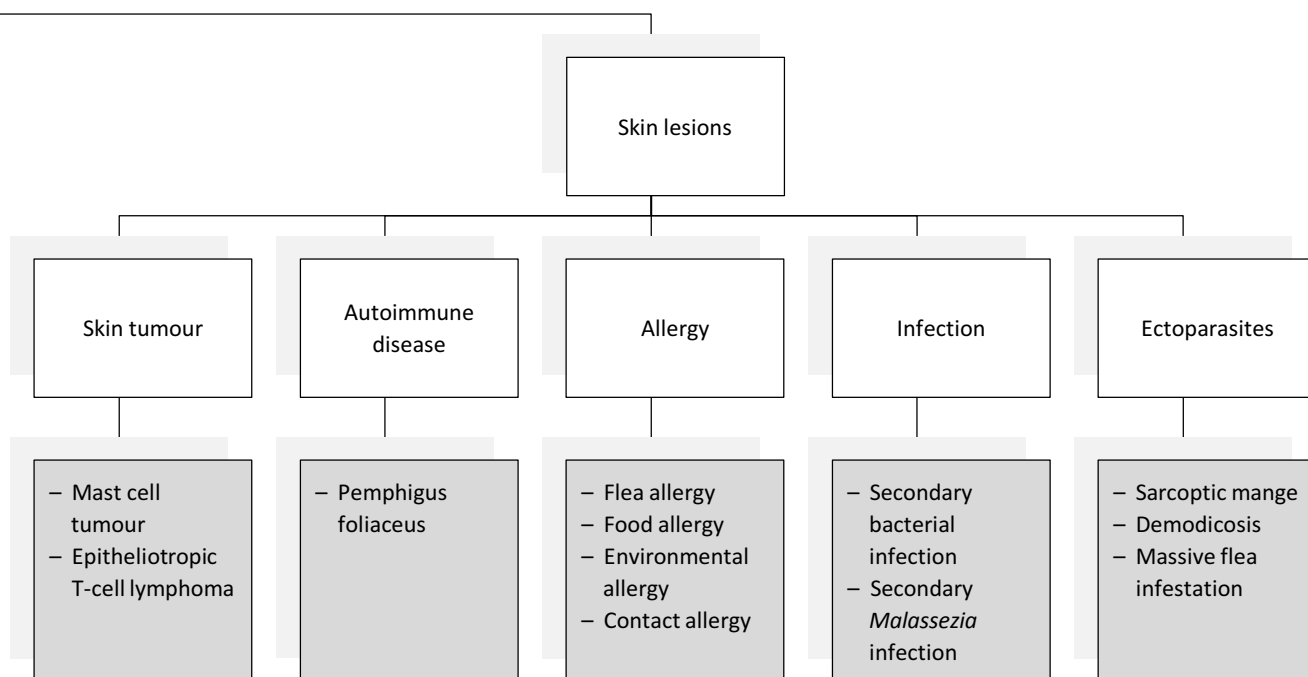


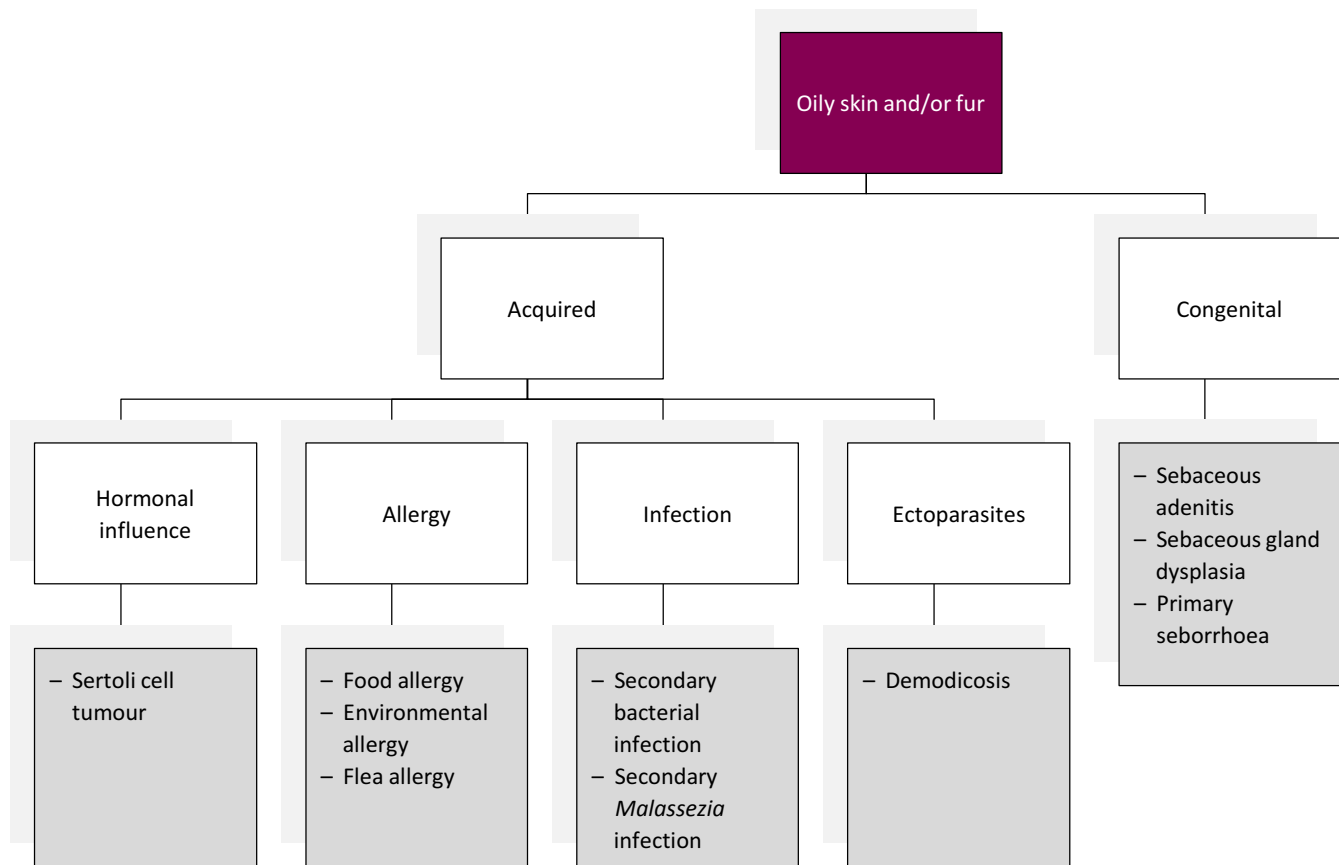


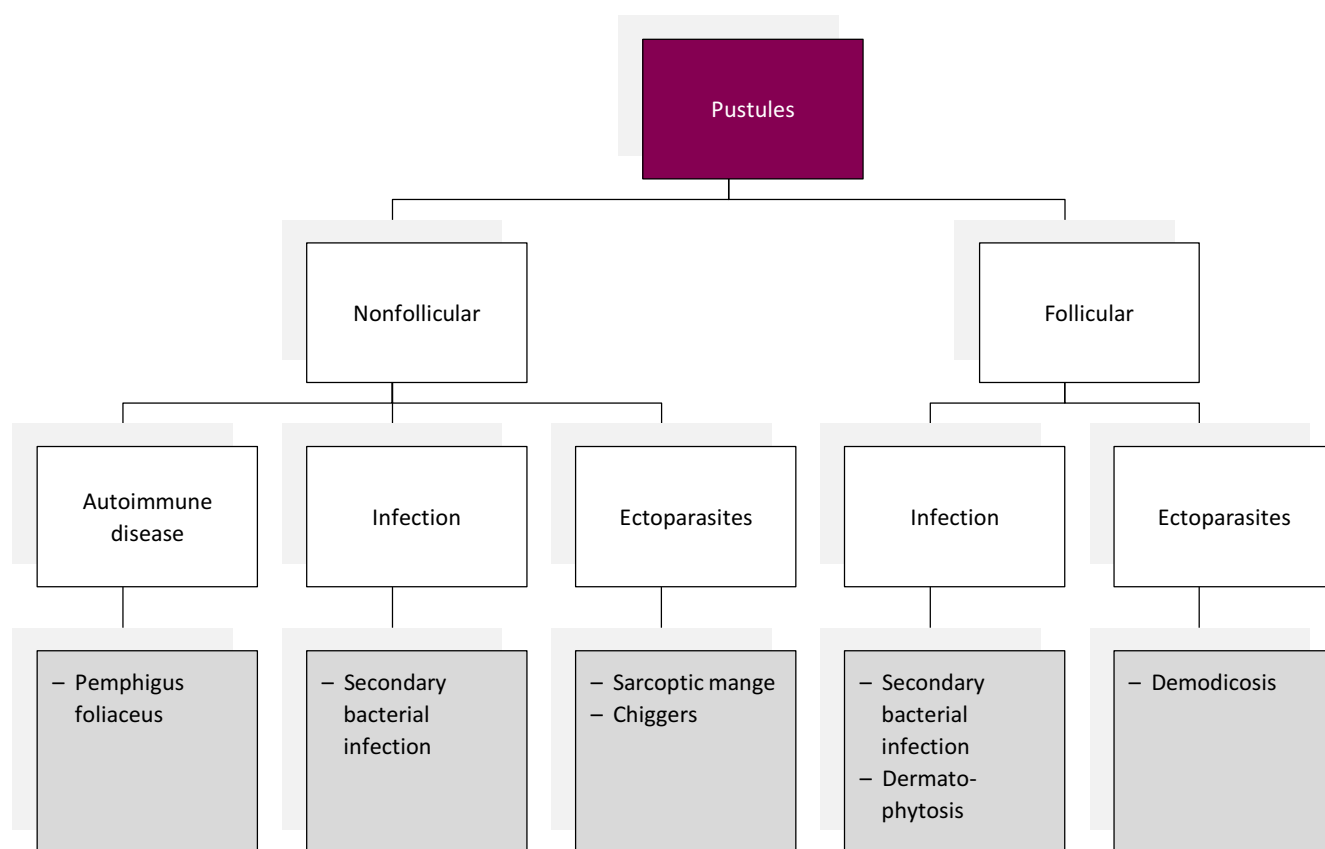
Dermatology

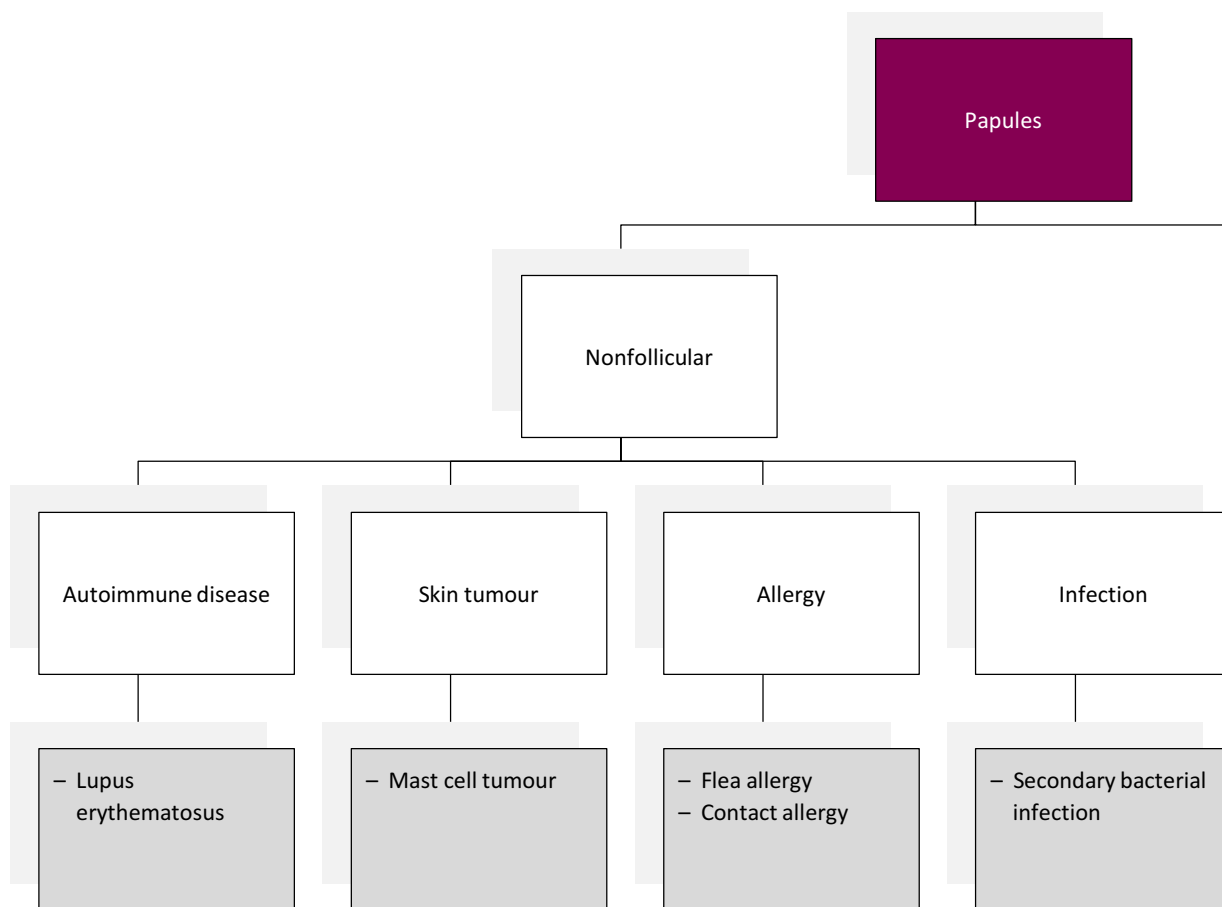


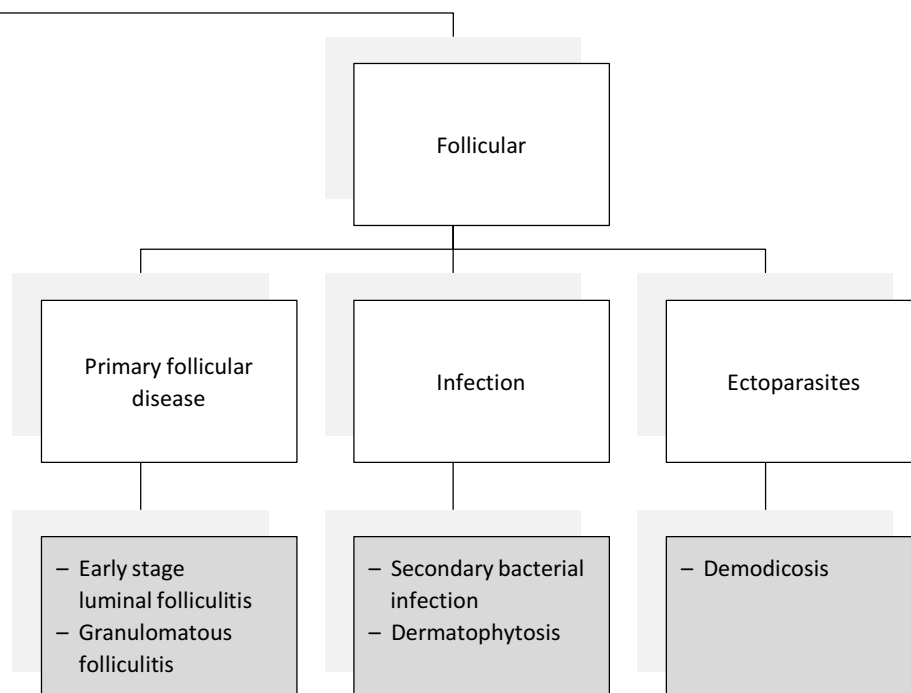


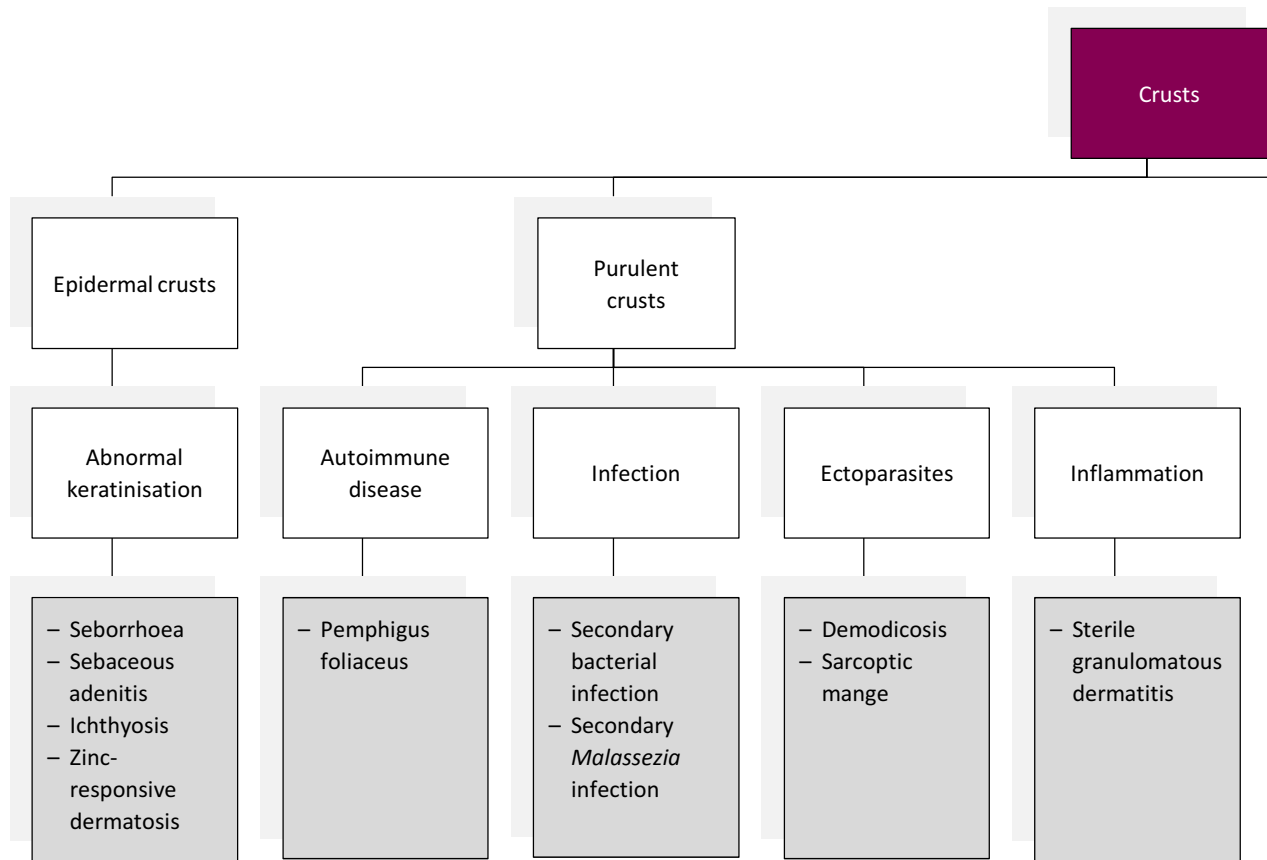


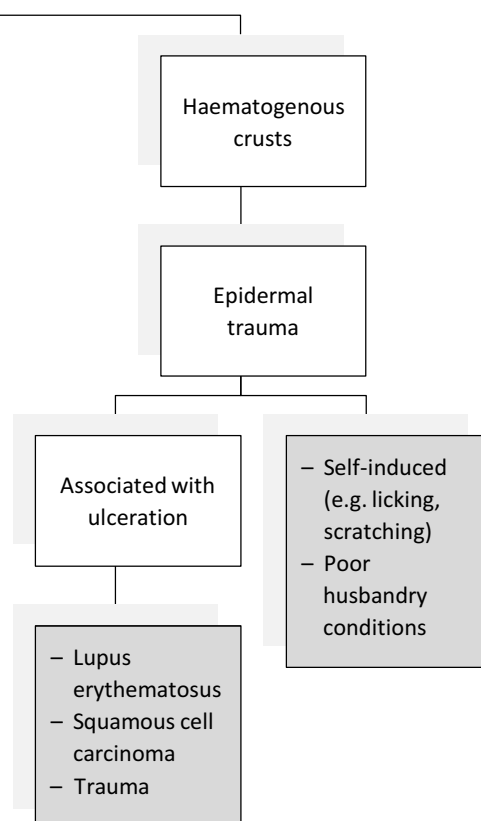




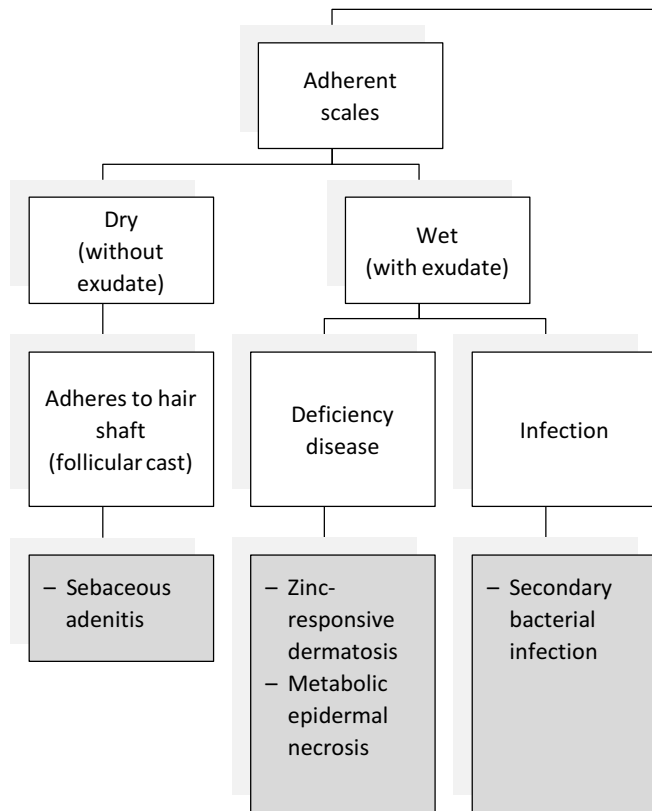


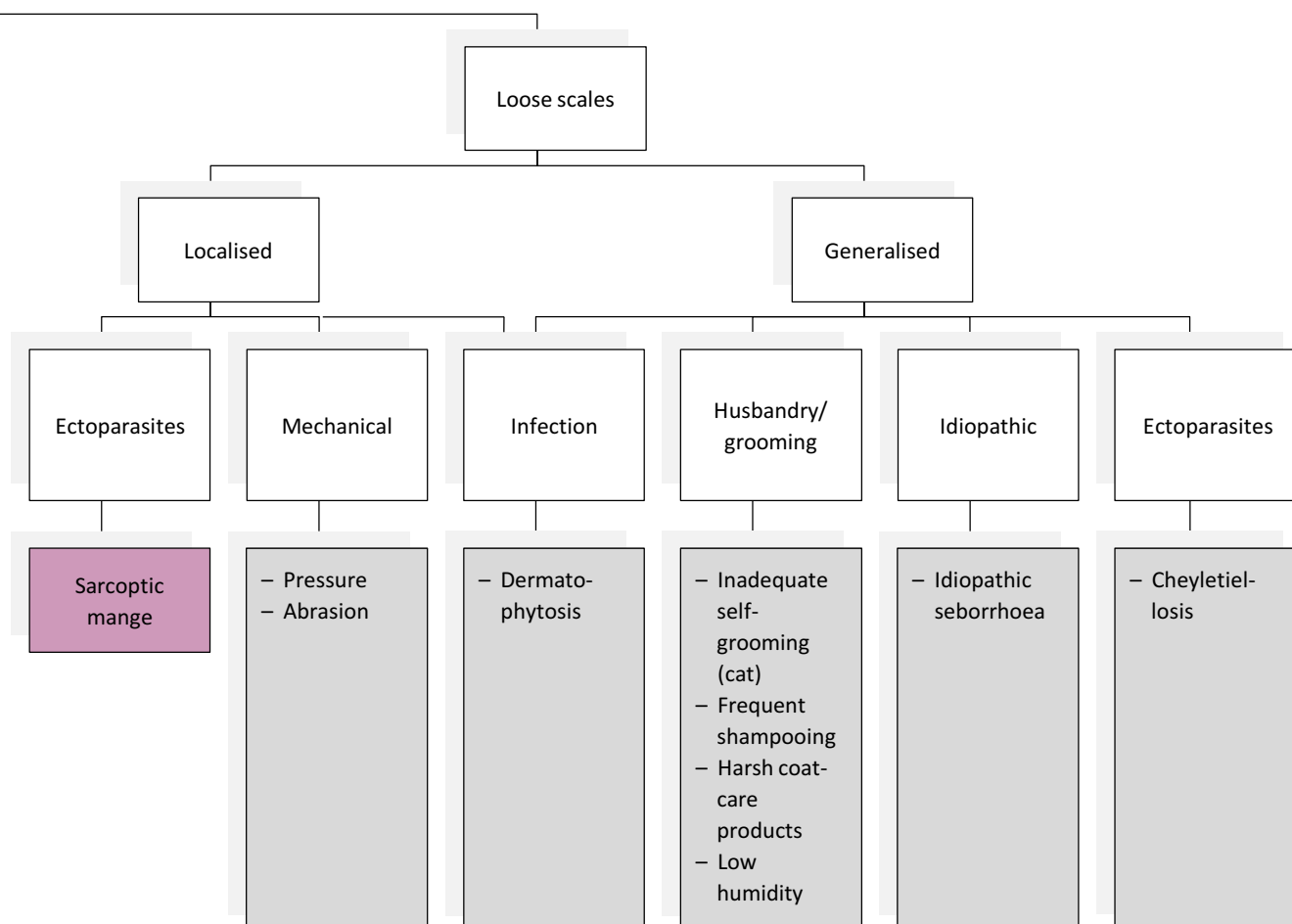


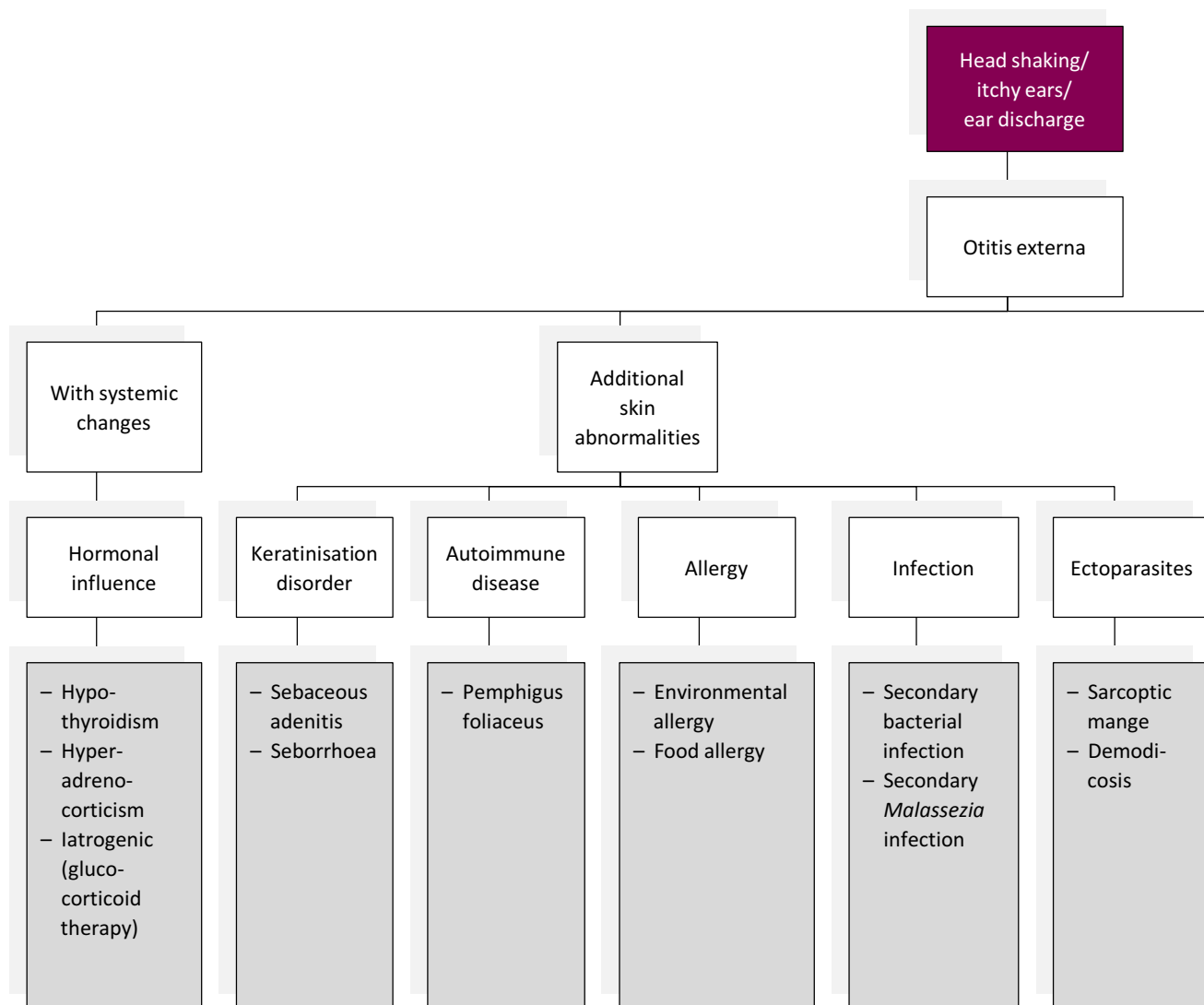


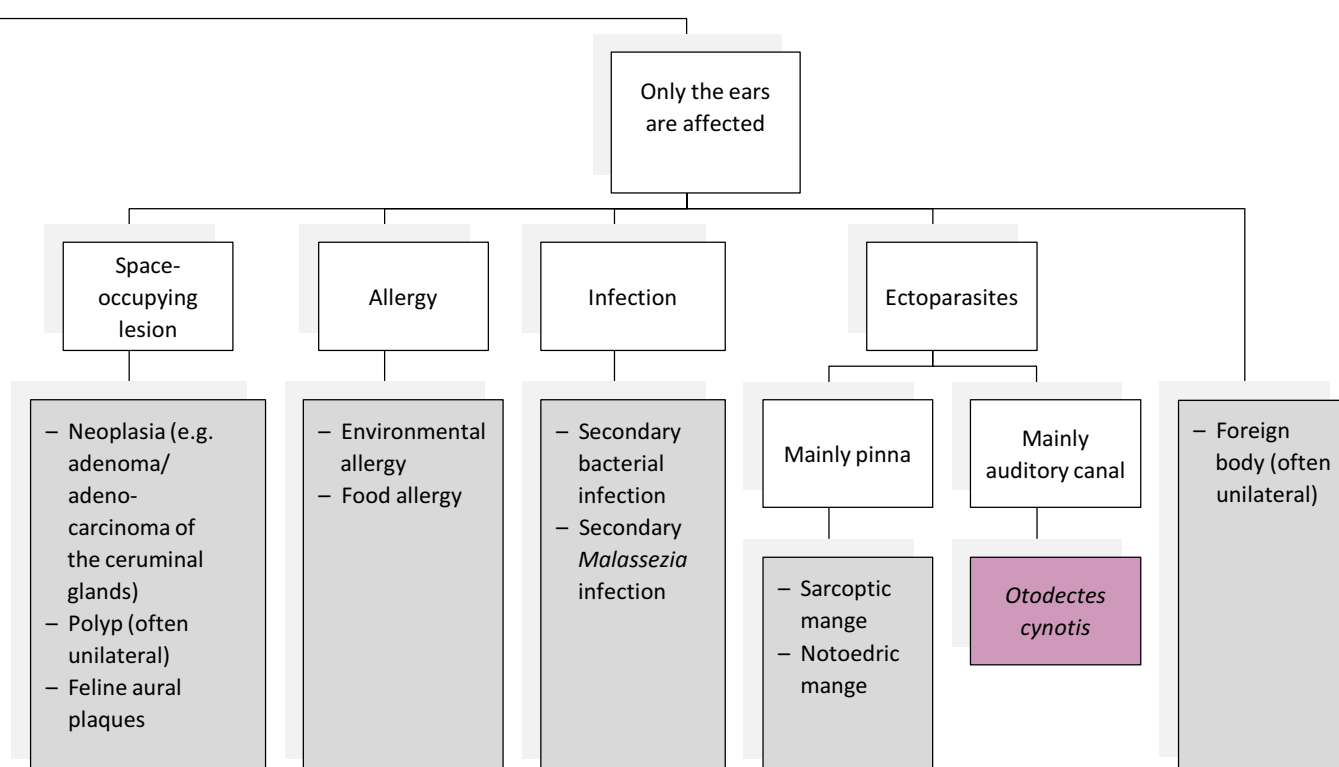


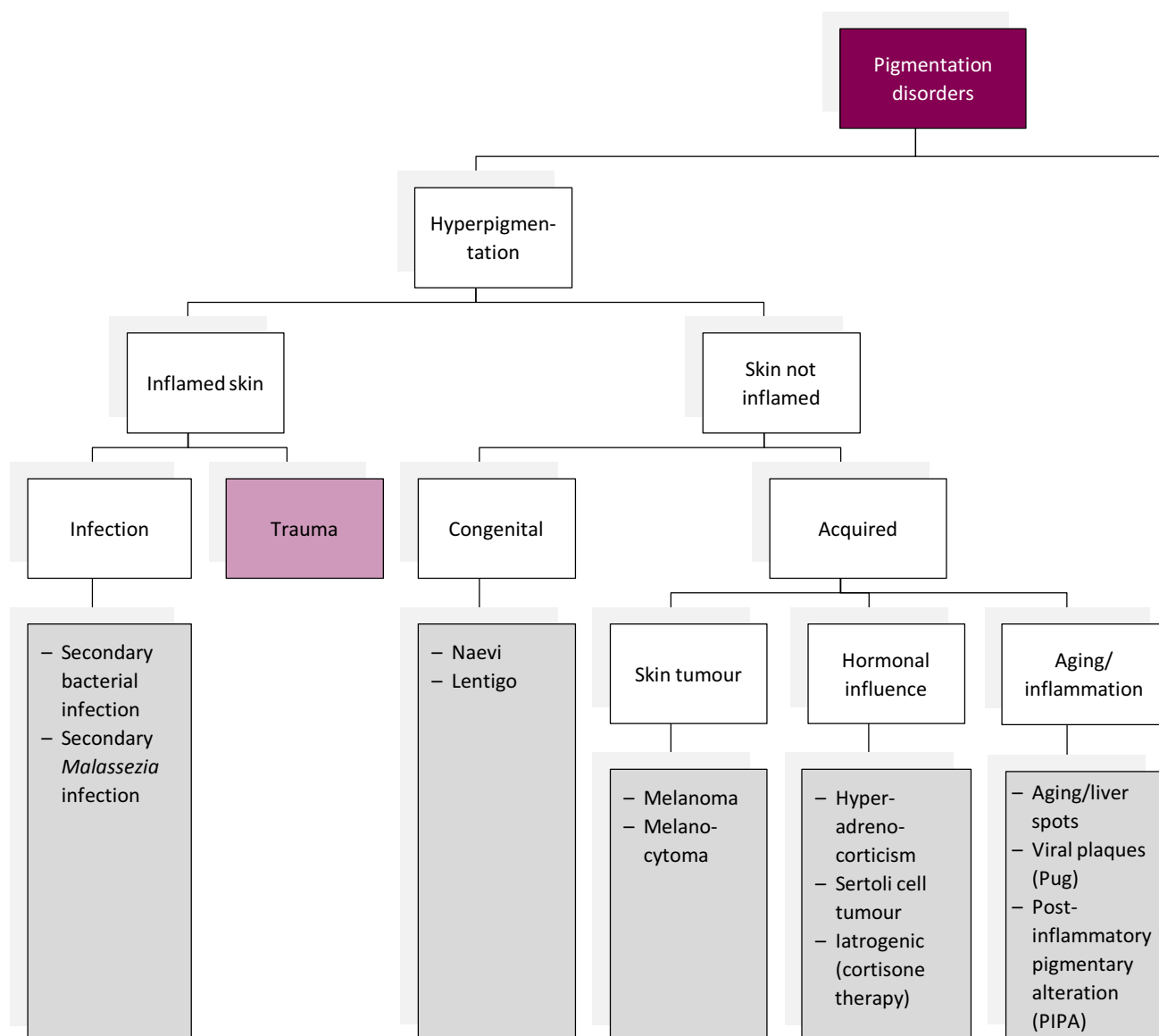
Scales

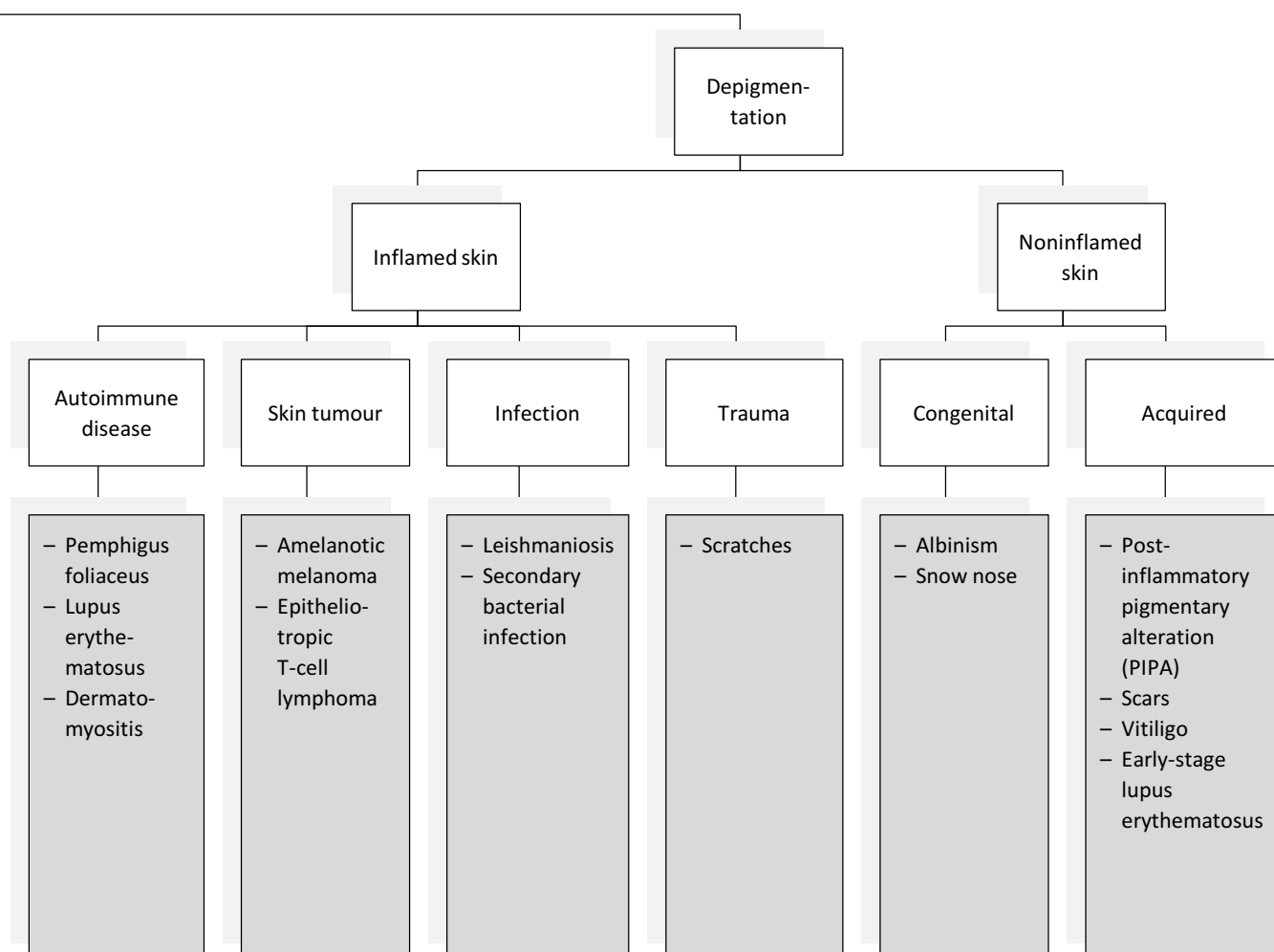


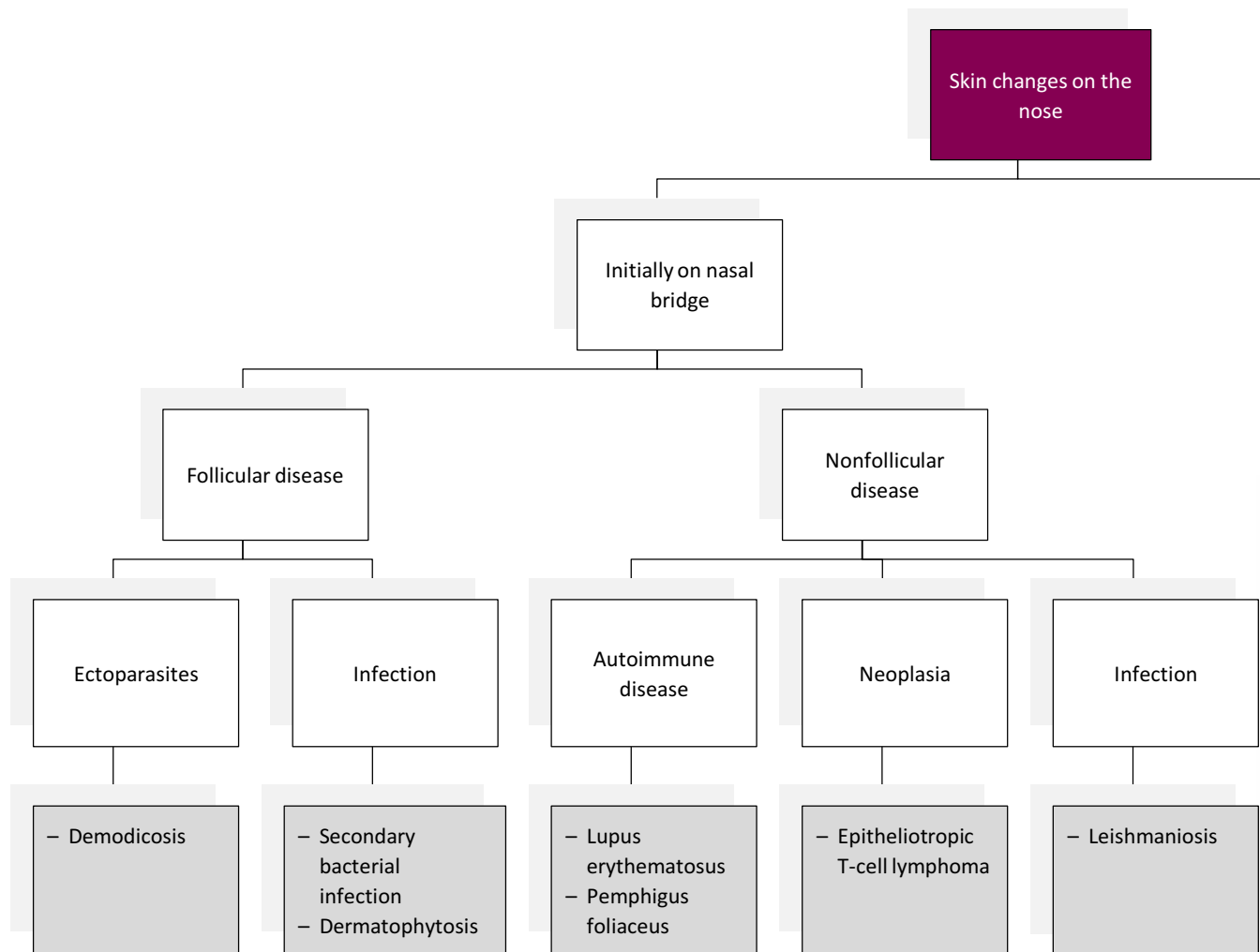


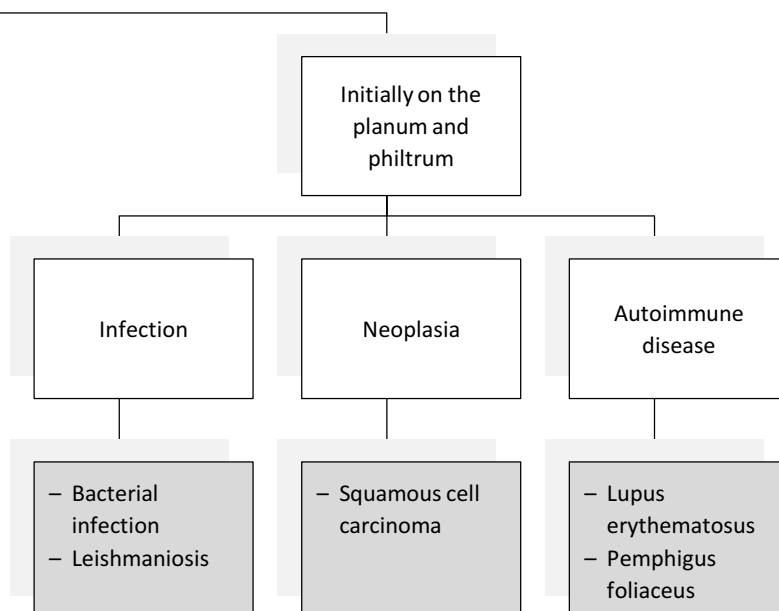


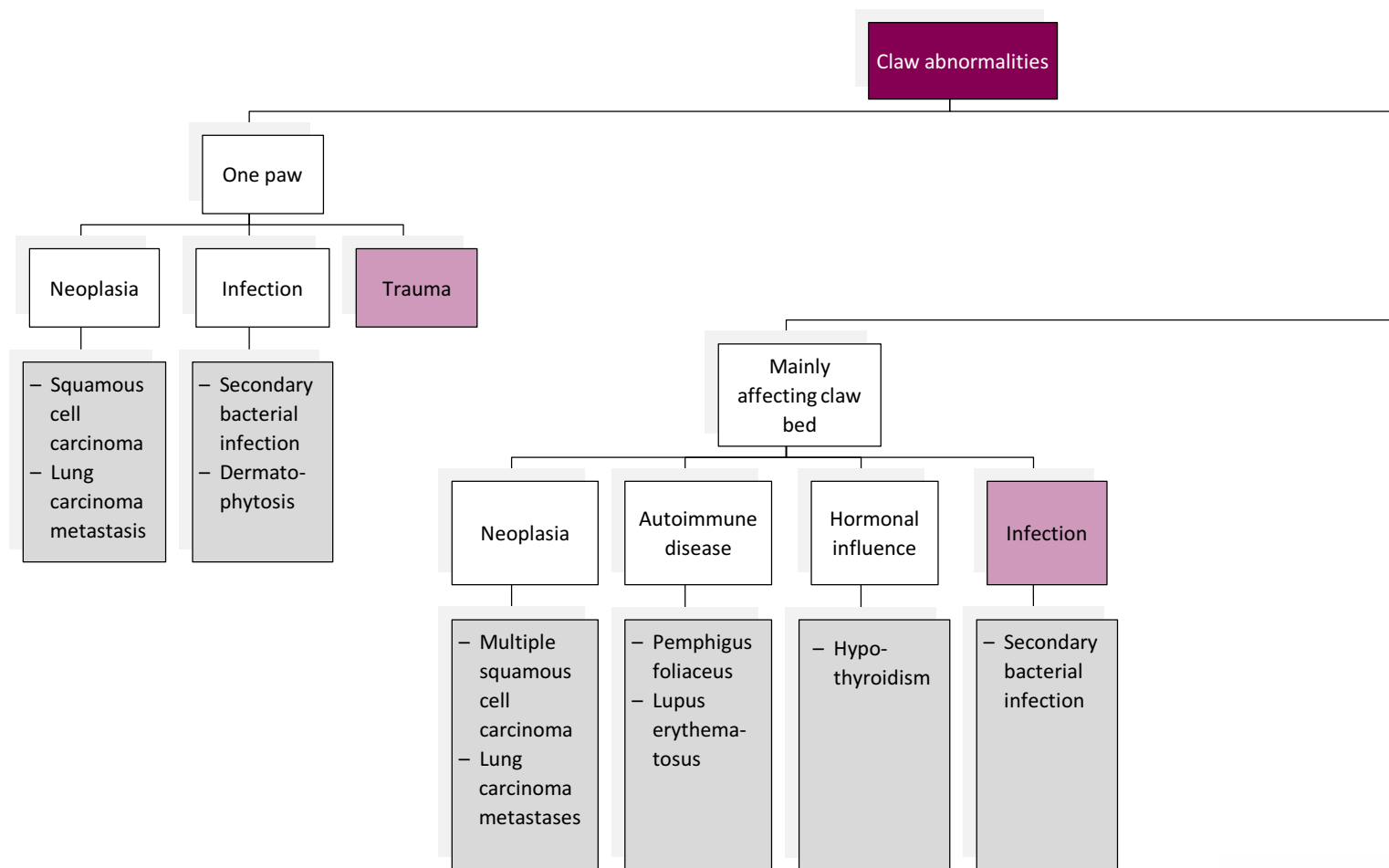


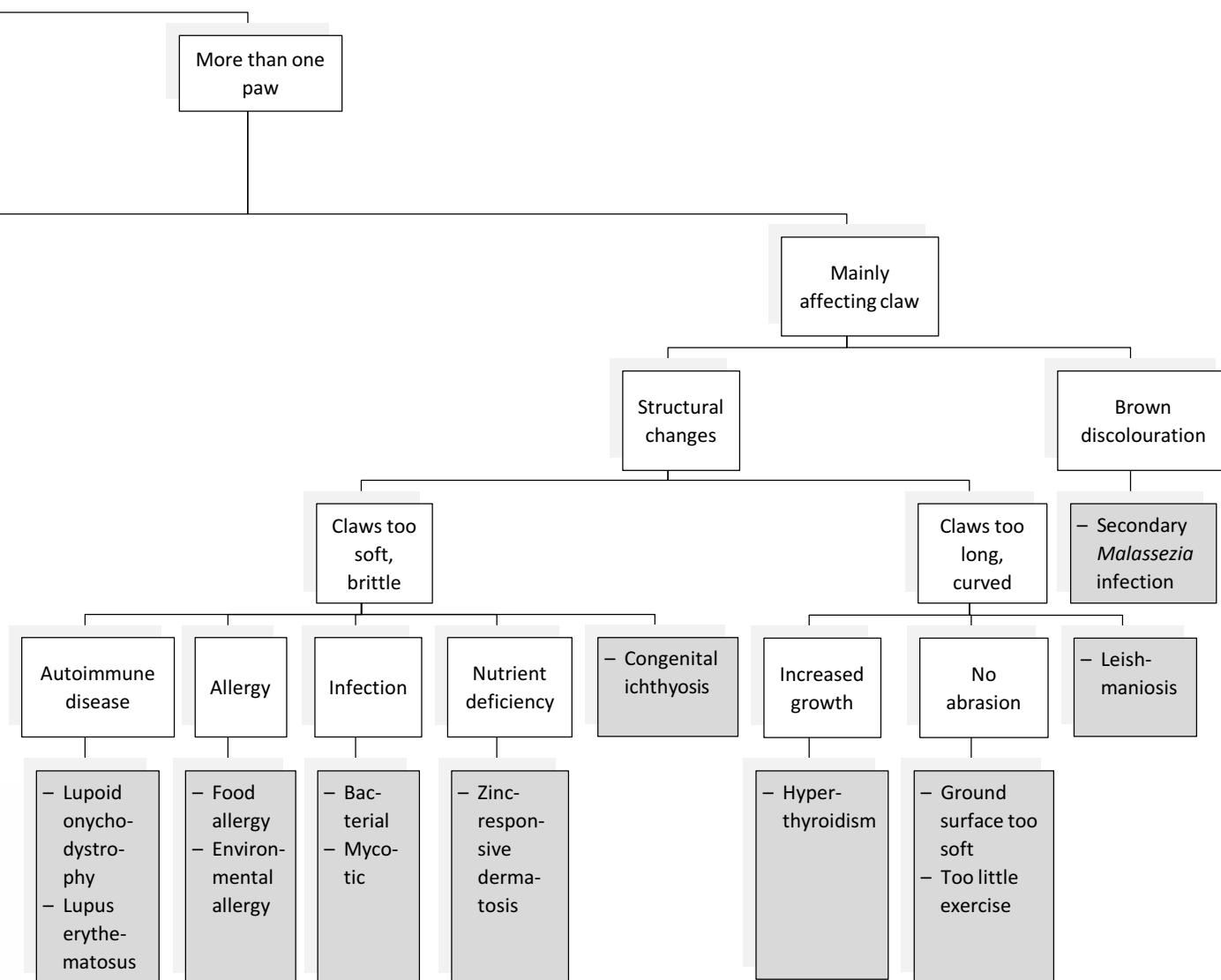


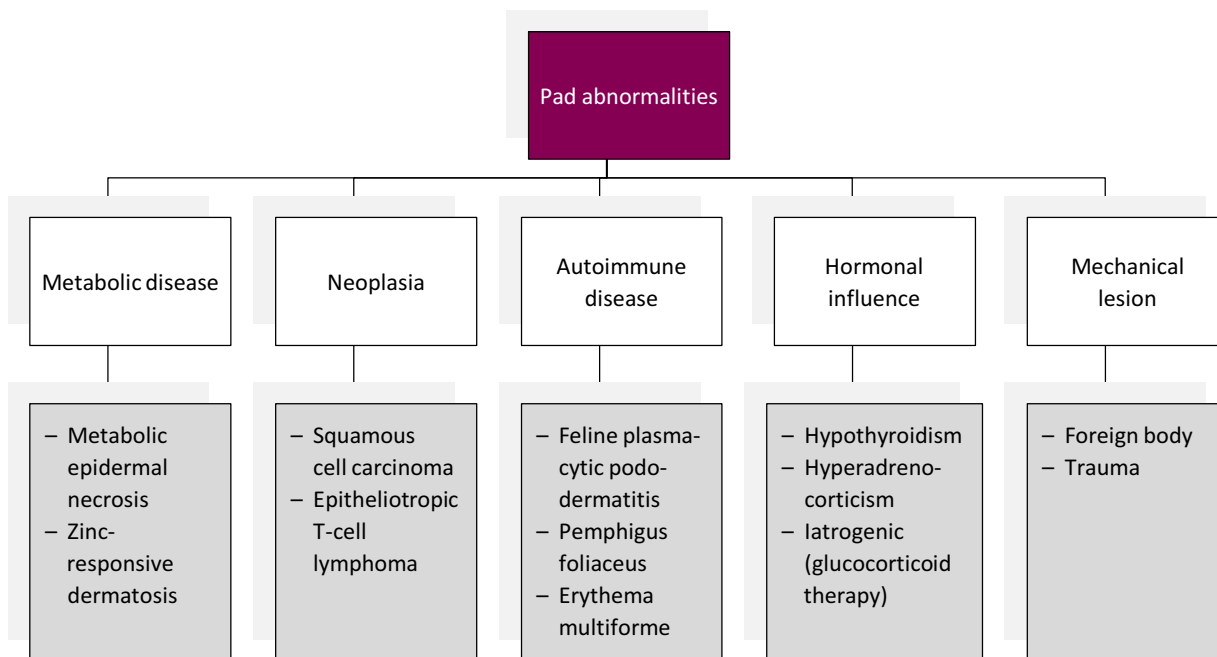




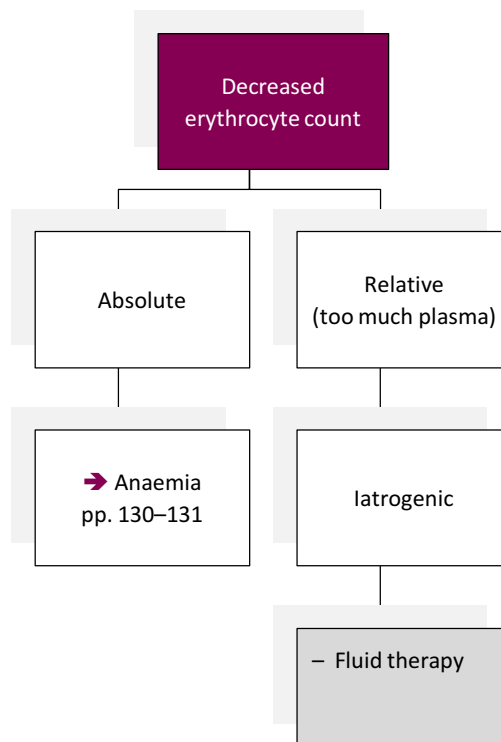


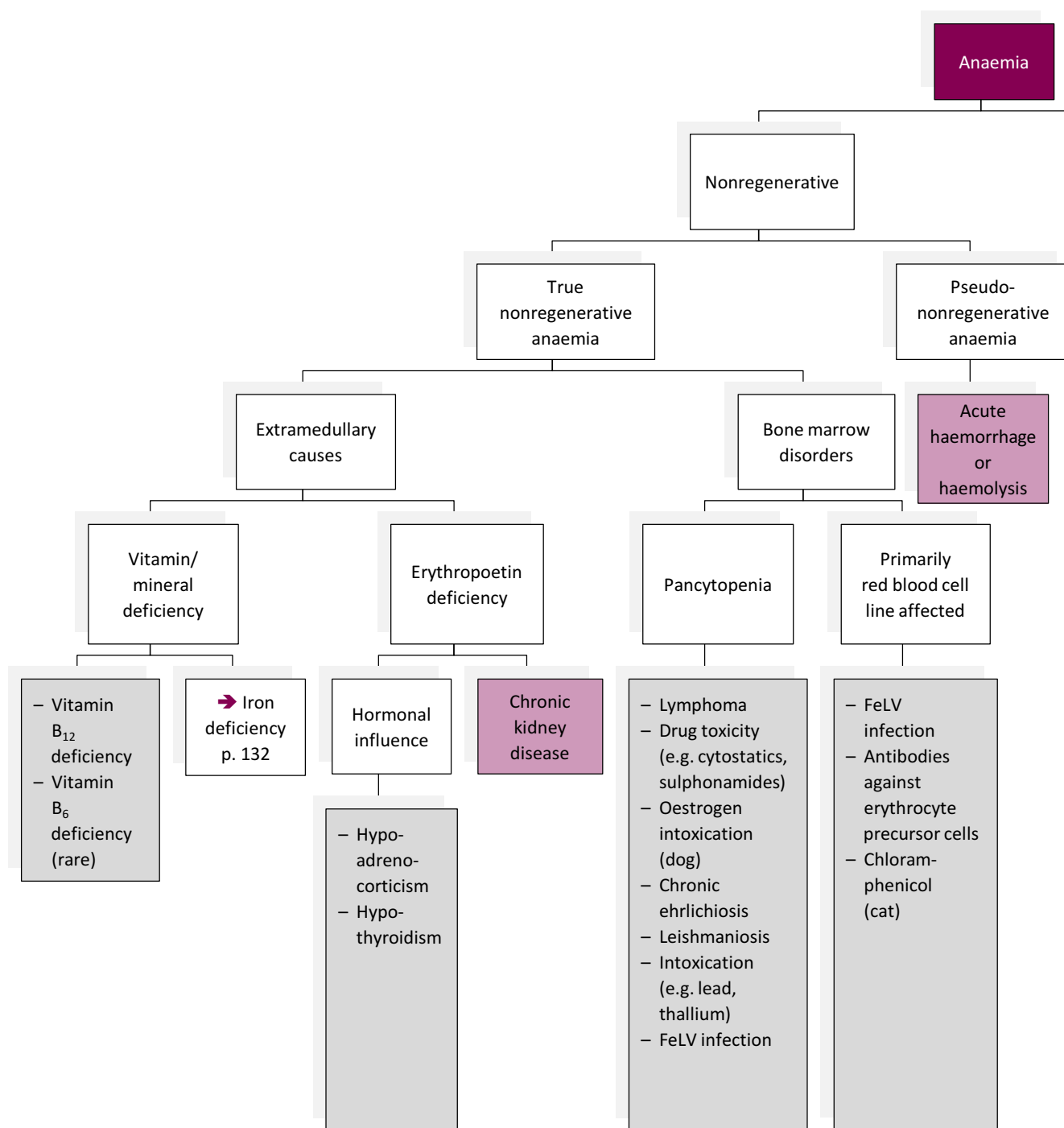


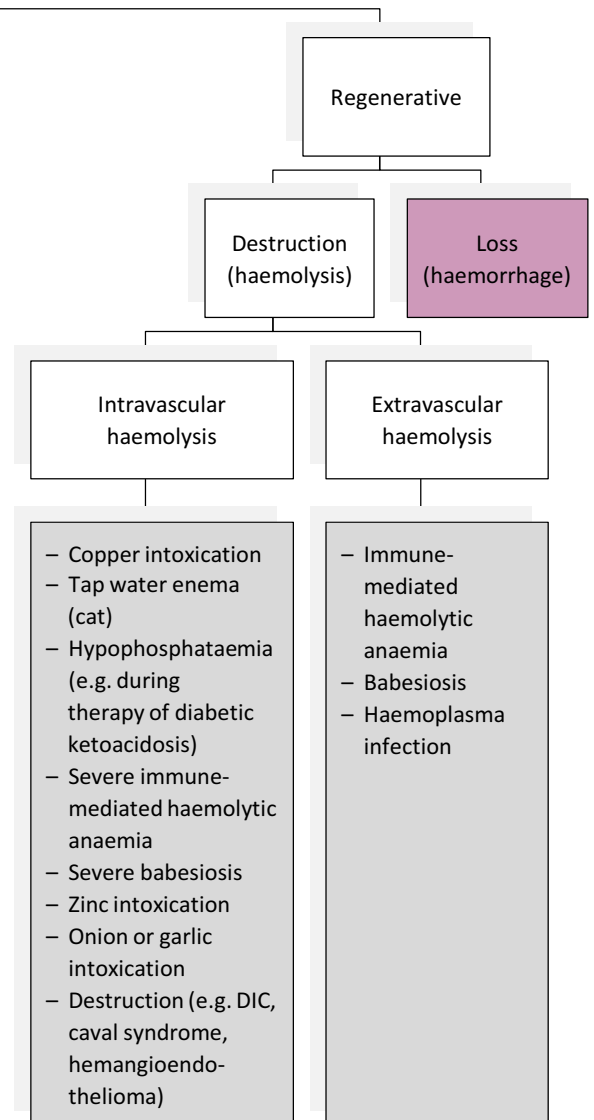


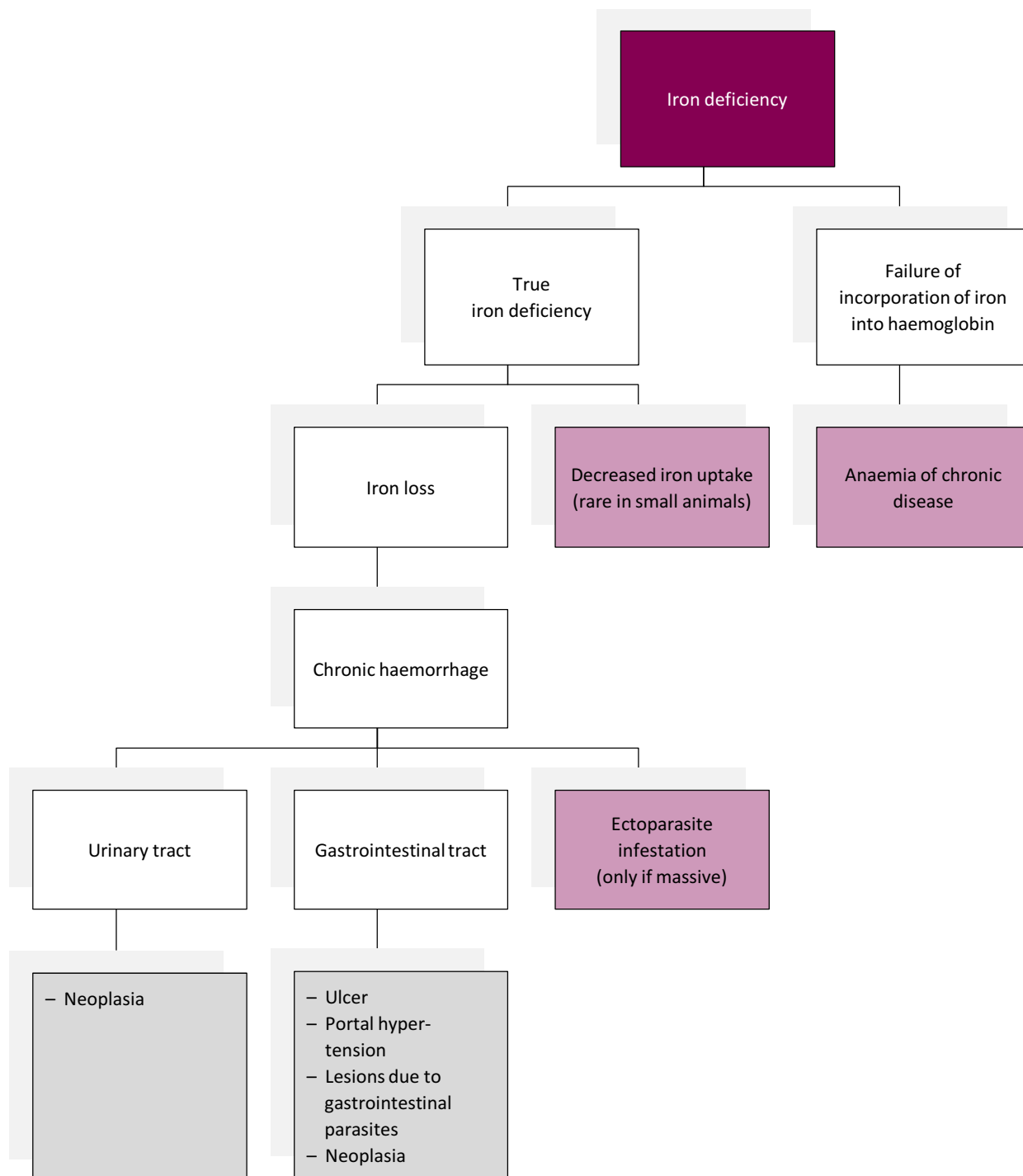


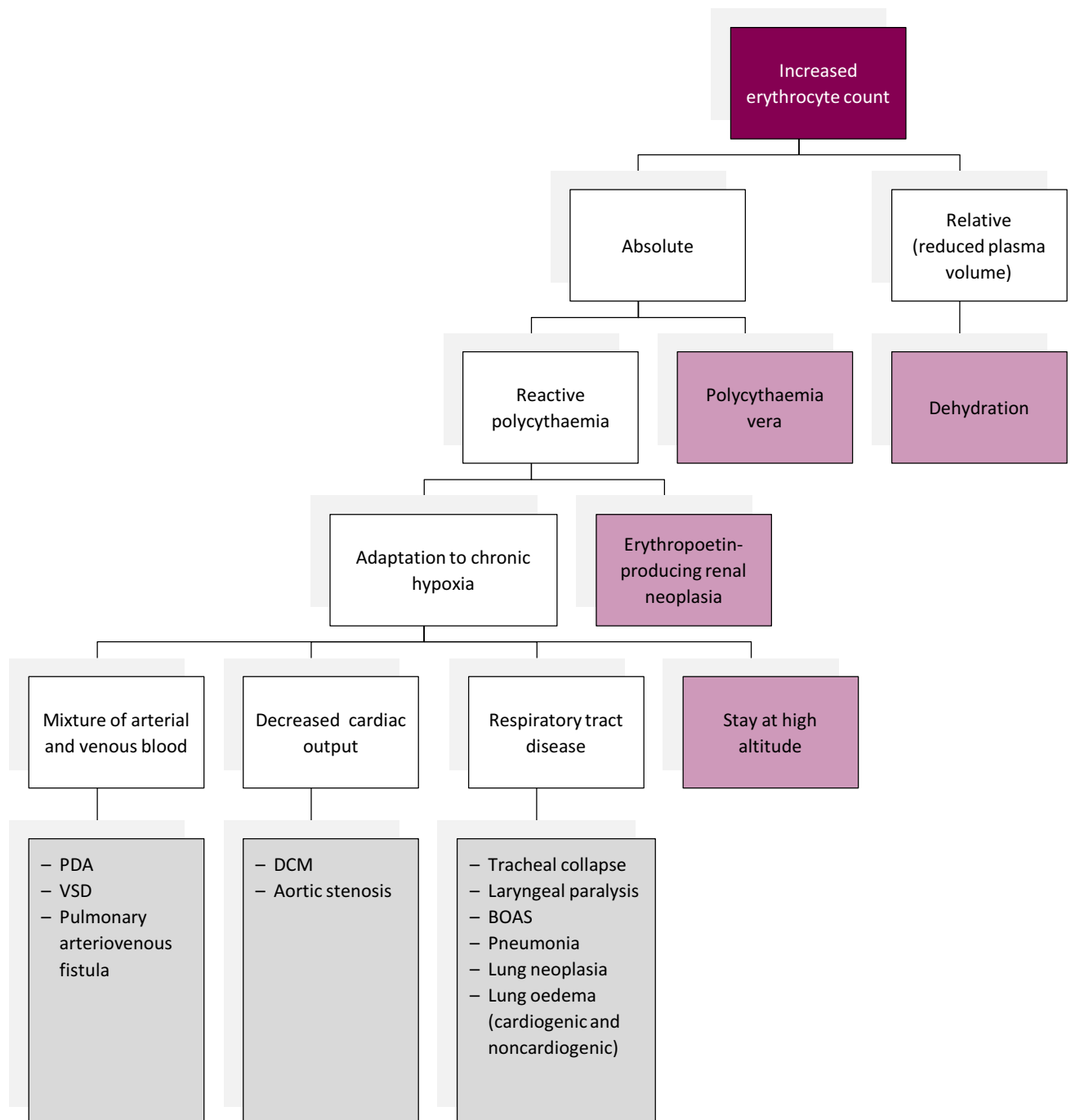
Basic laboratory diagnostics

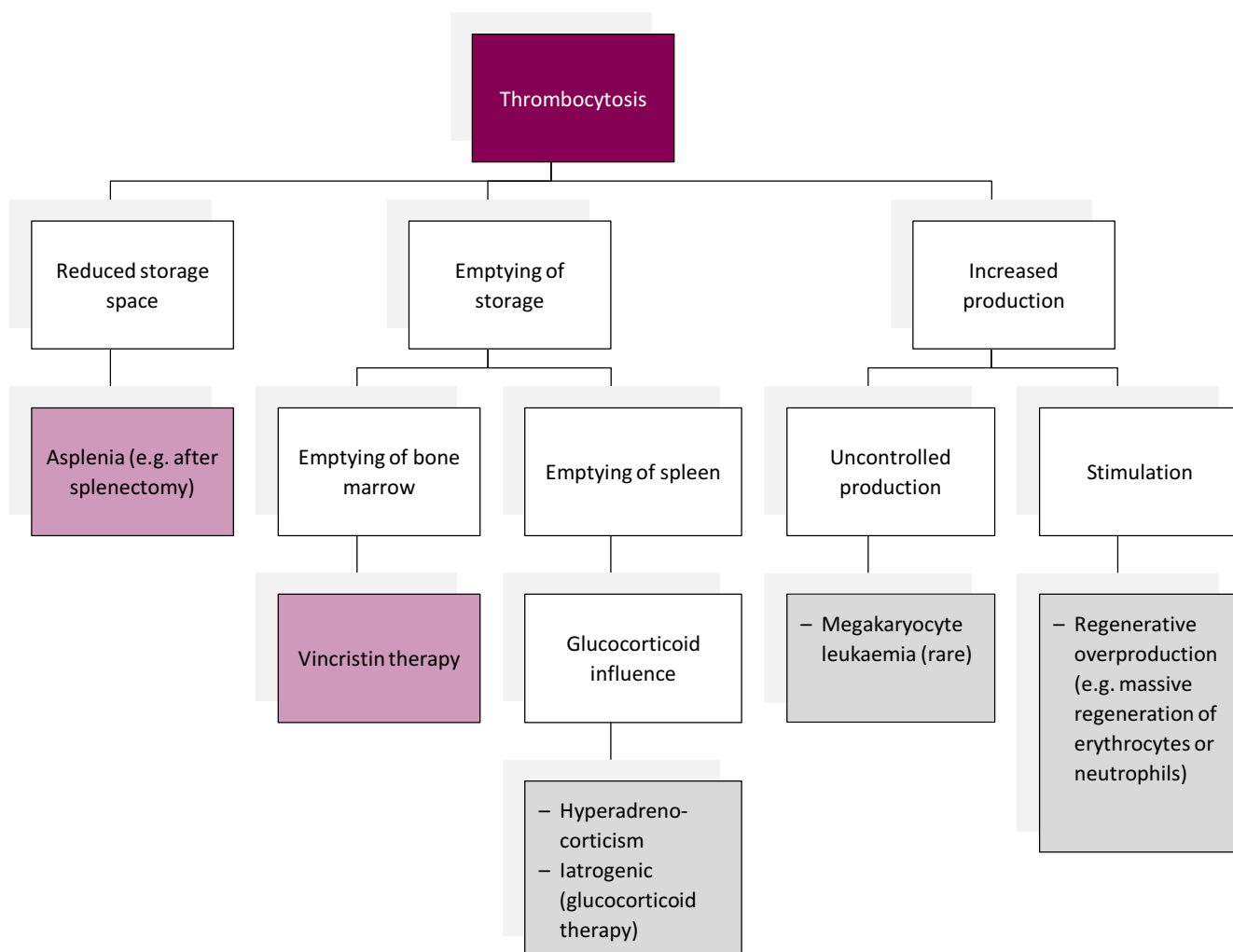


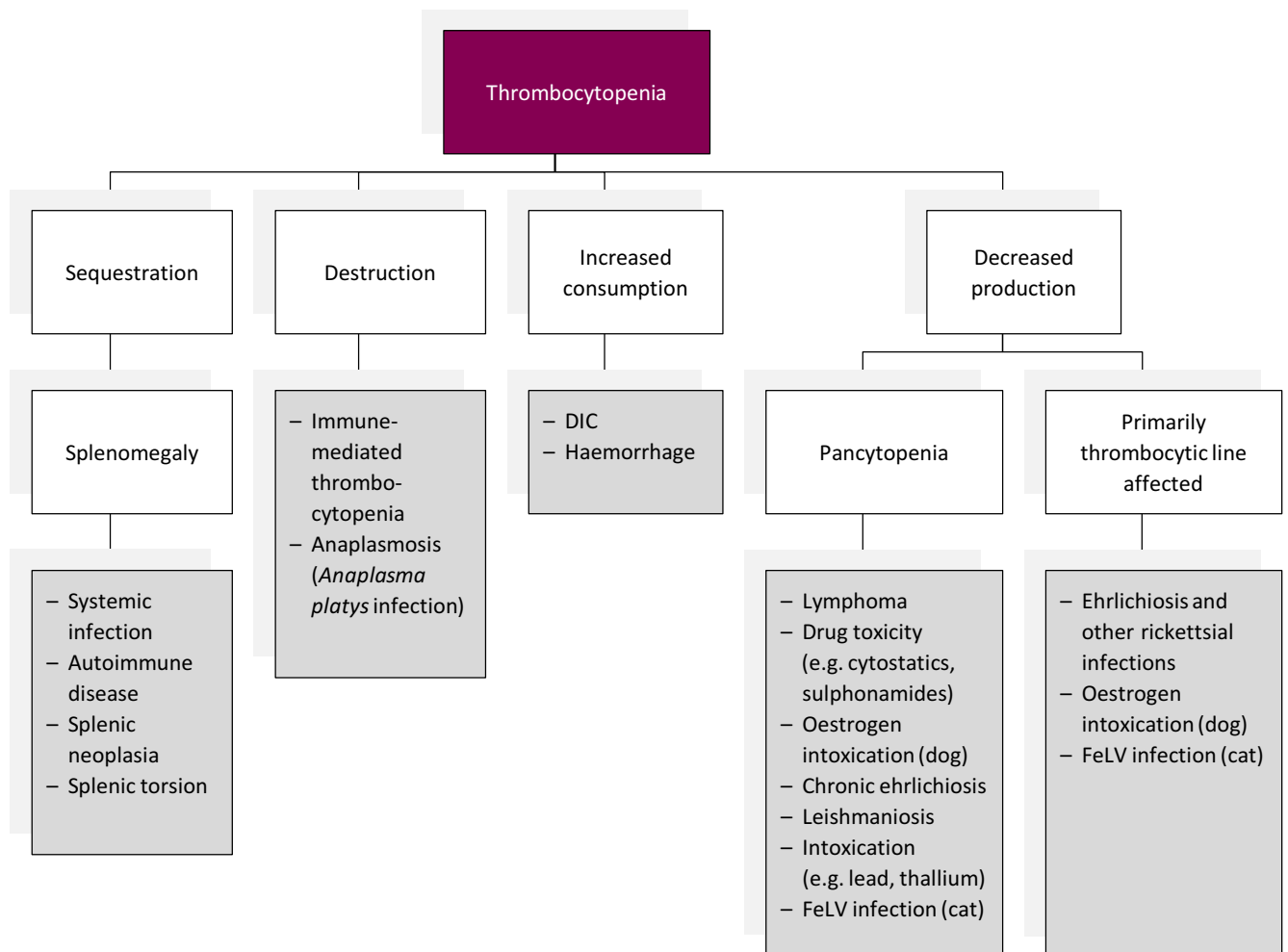


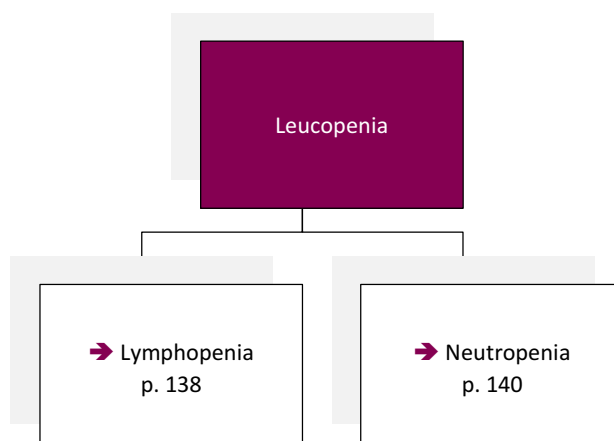


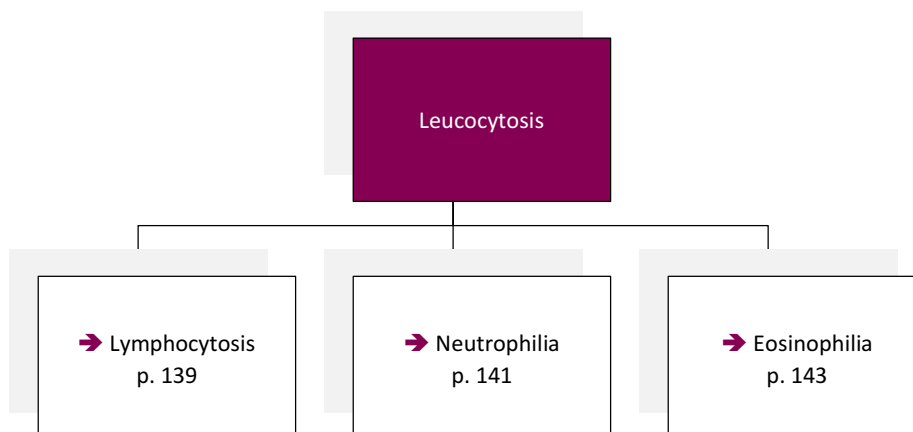


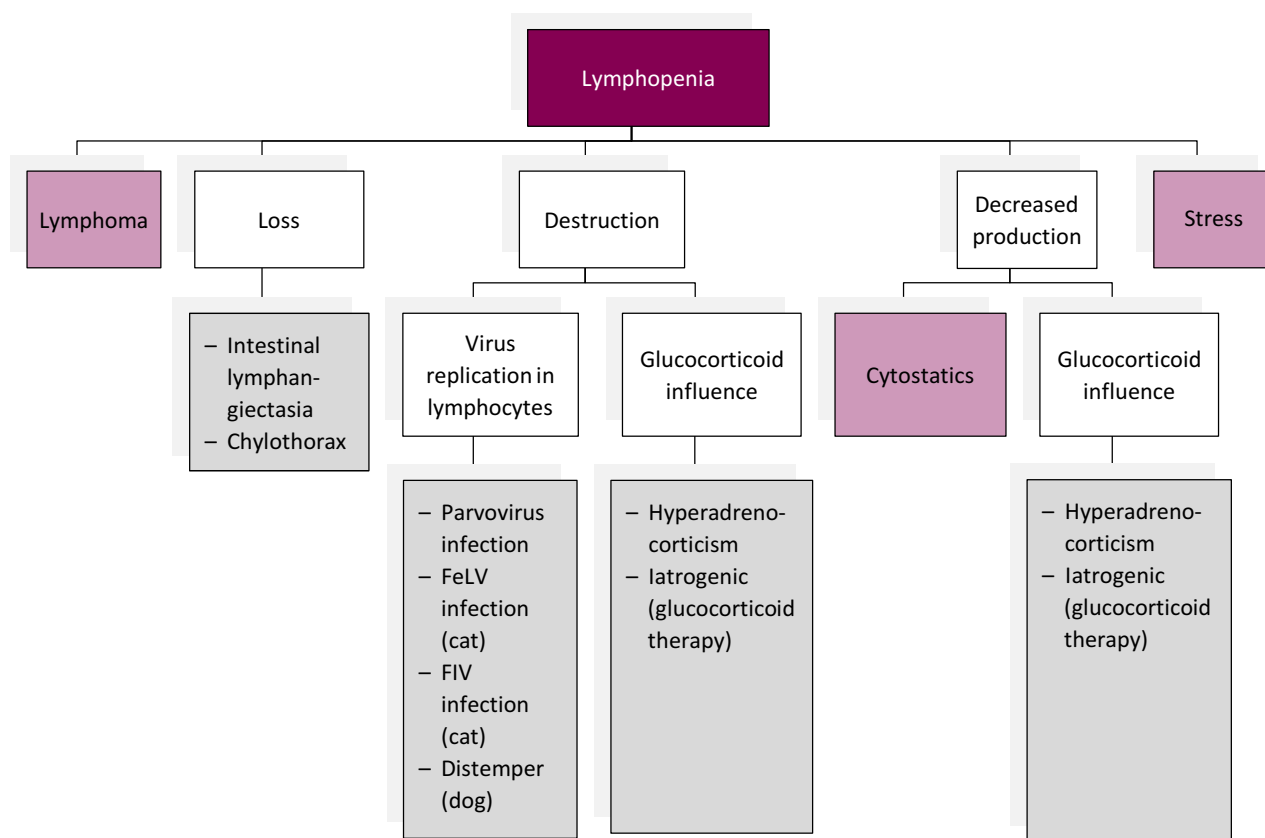


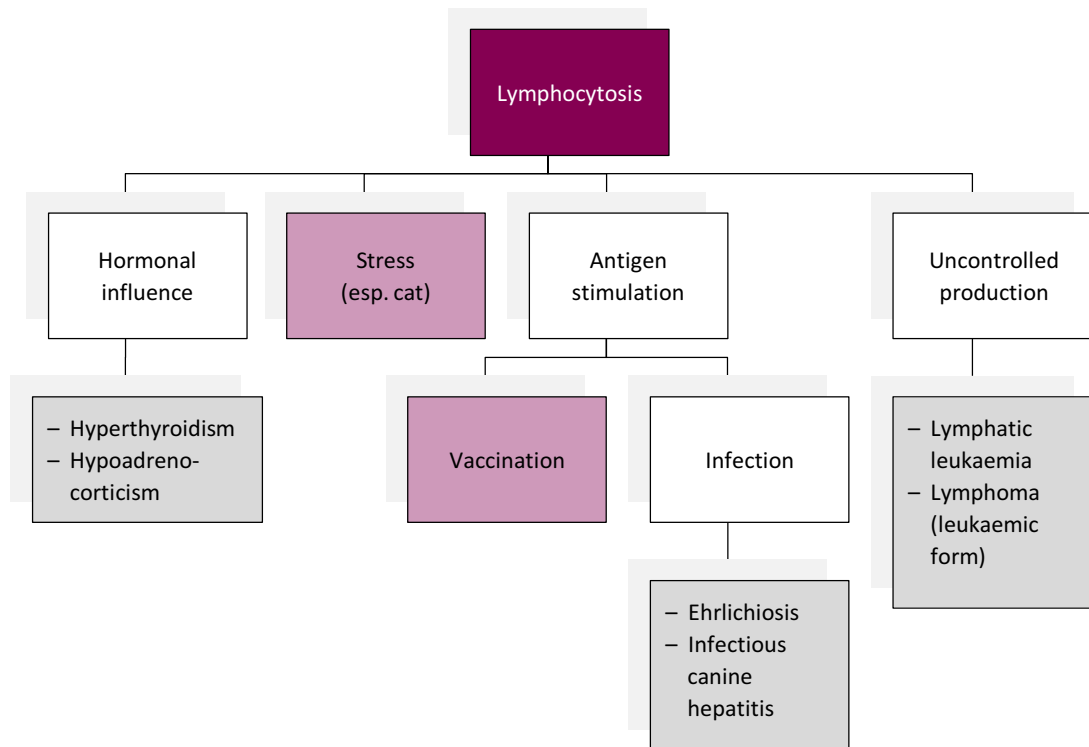


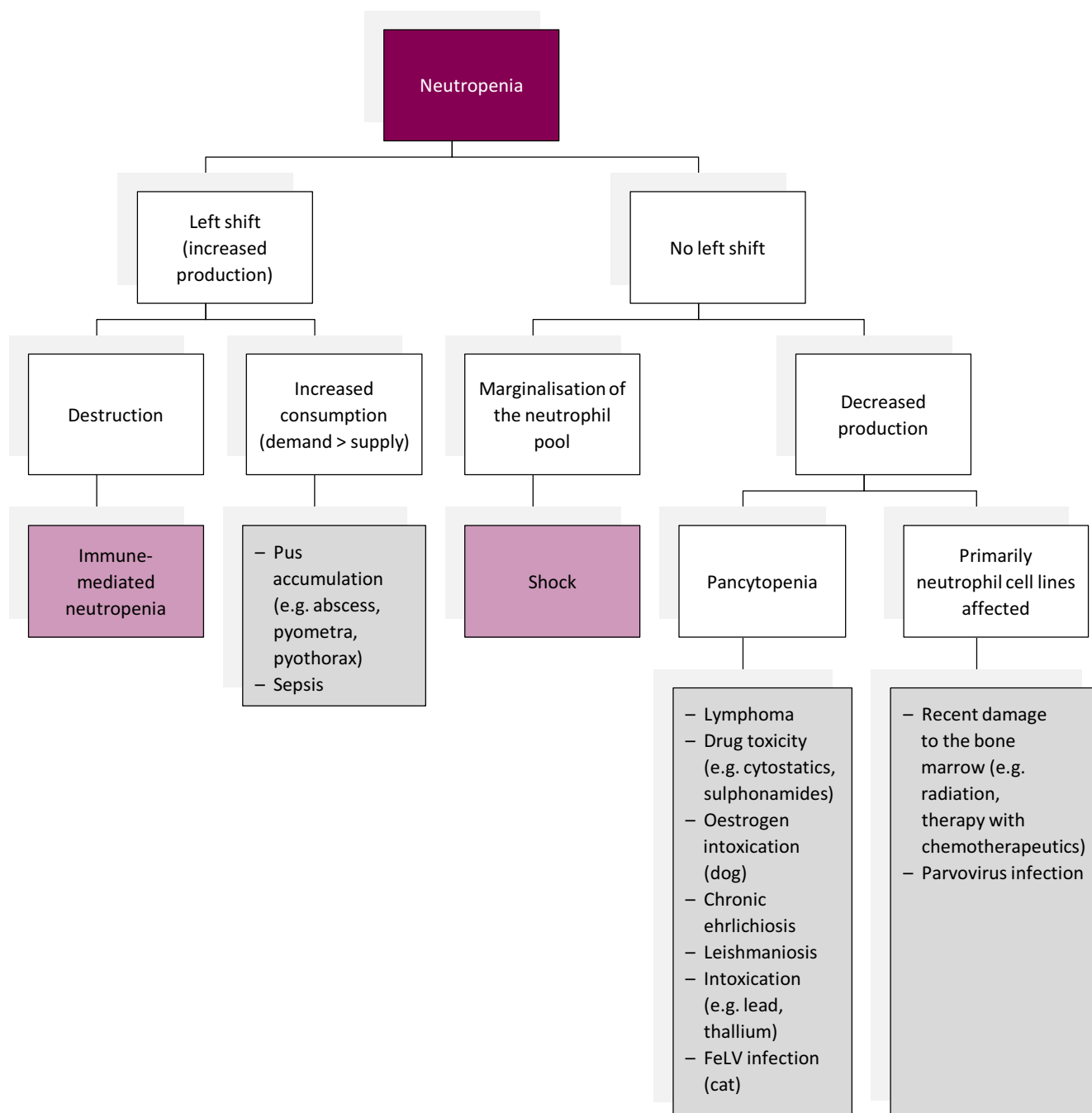


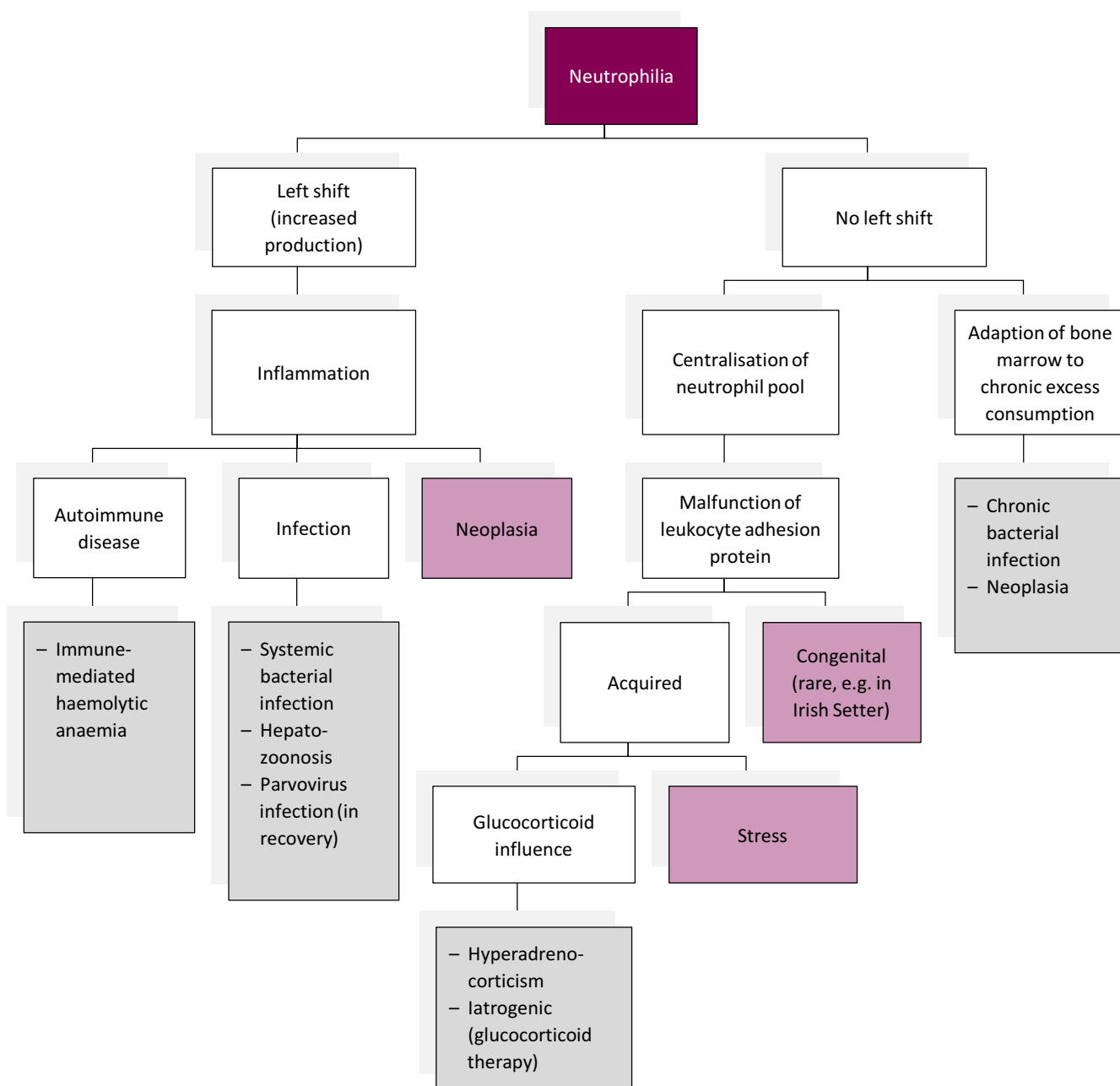


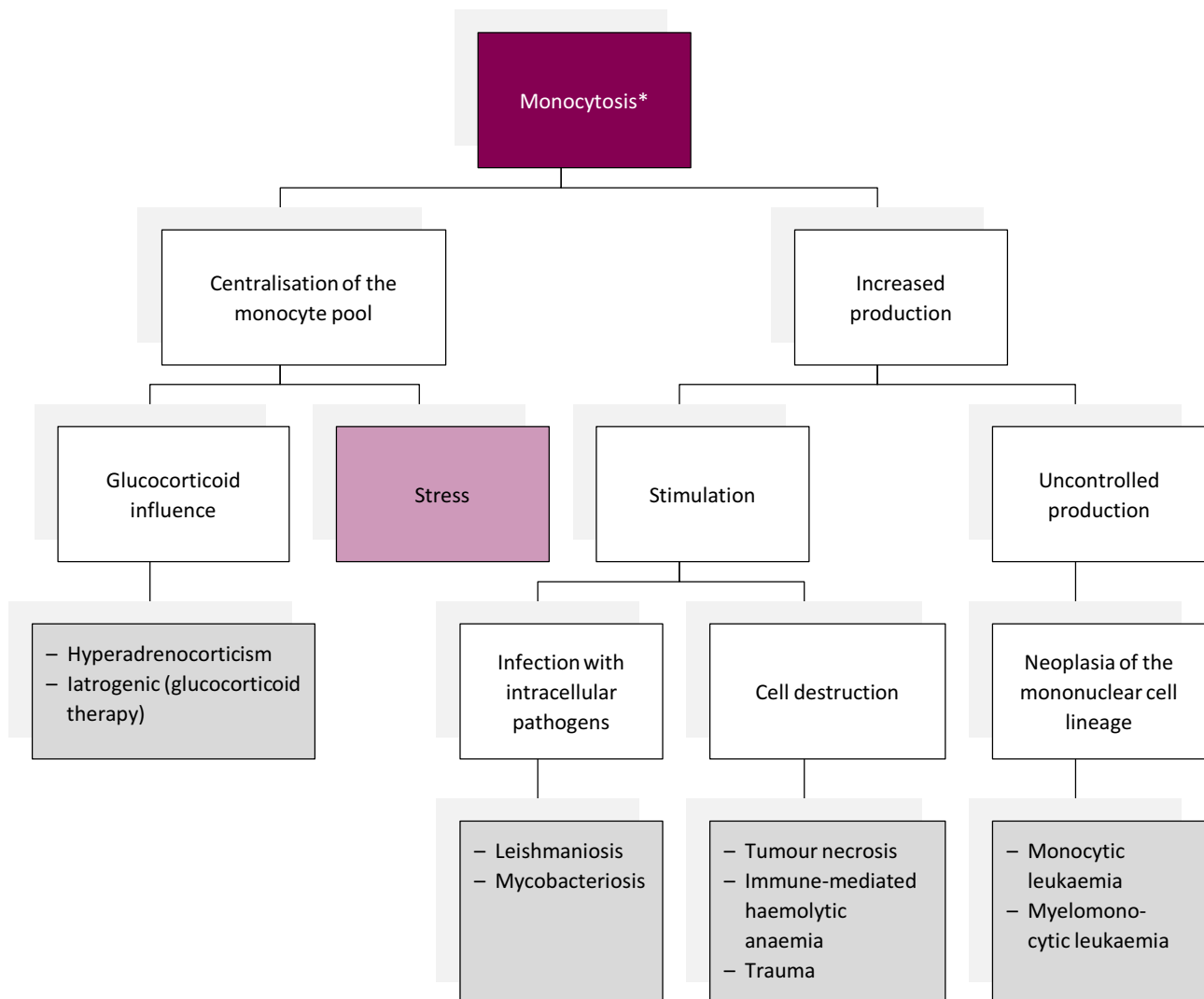




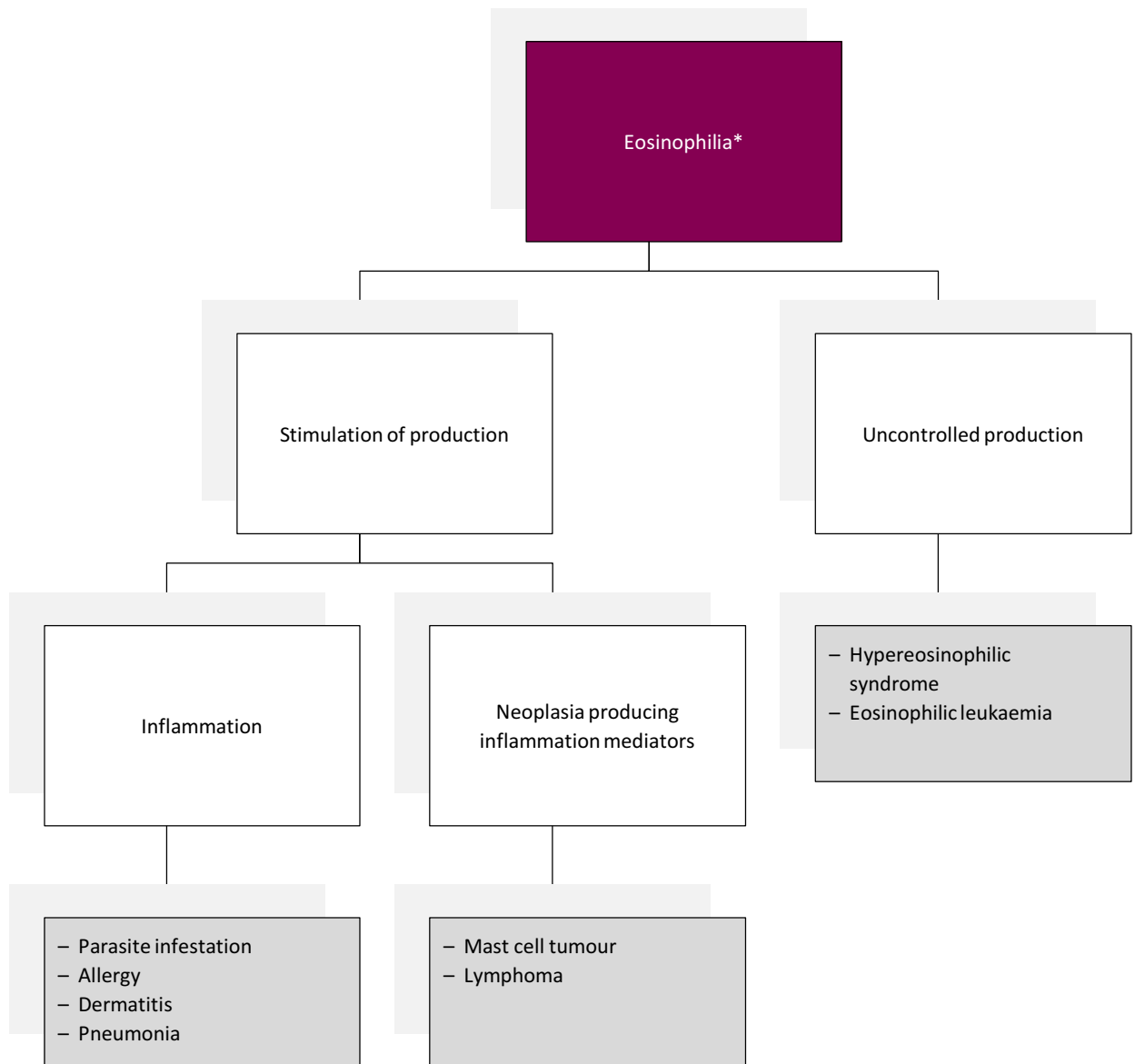




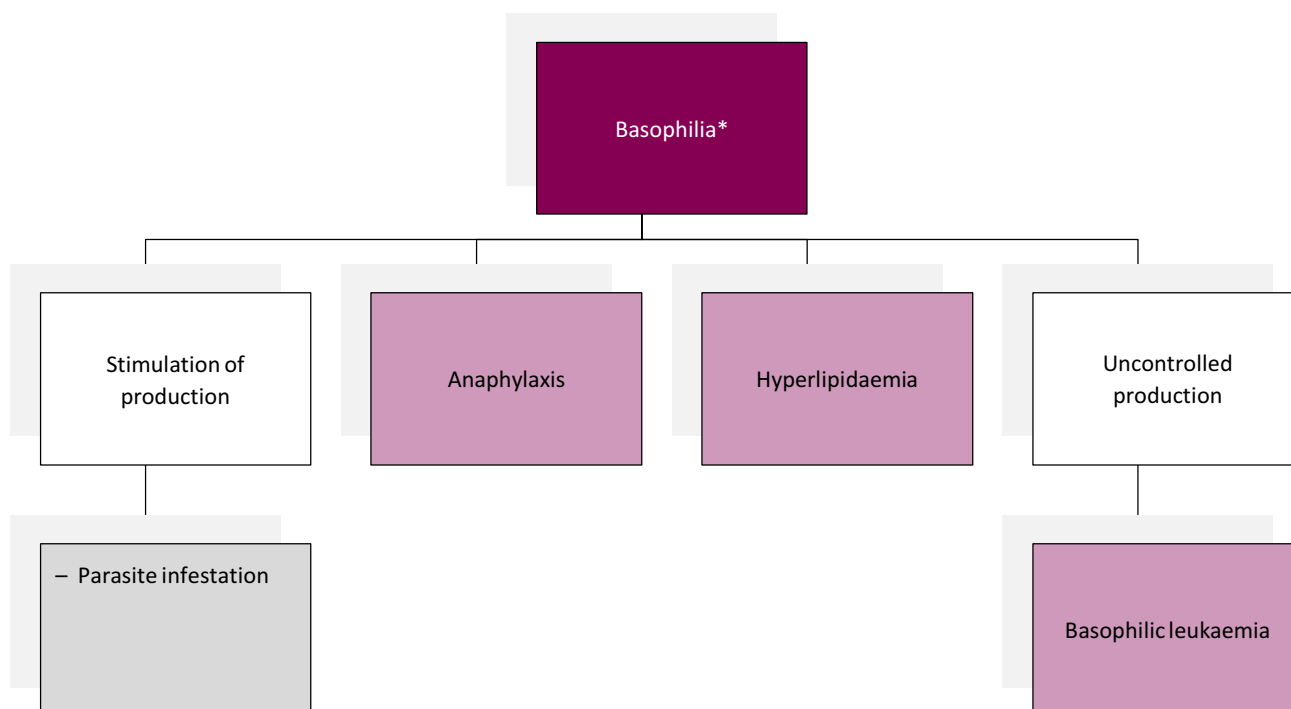




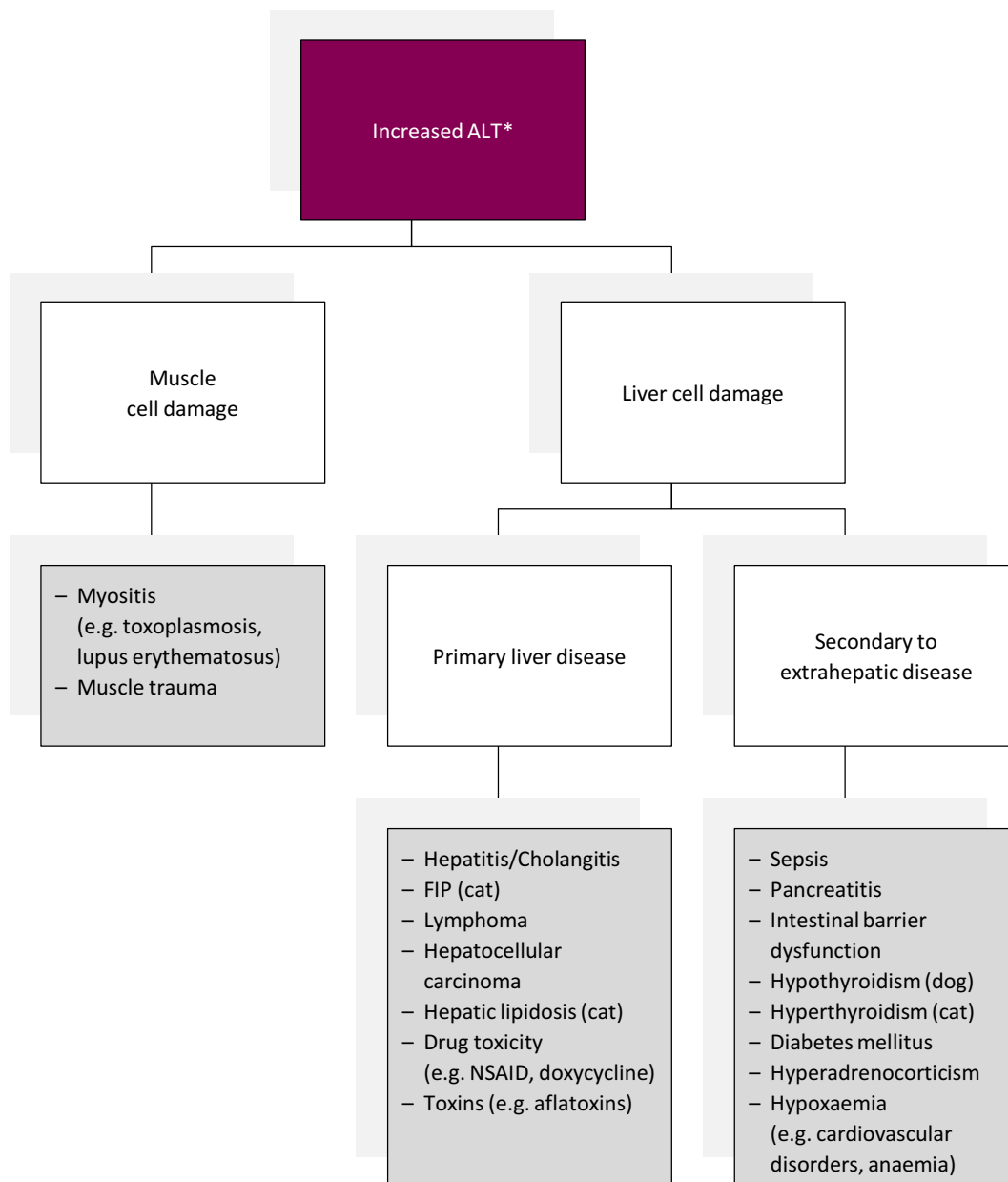
* Monocytopenia is not clinically relevant



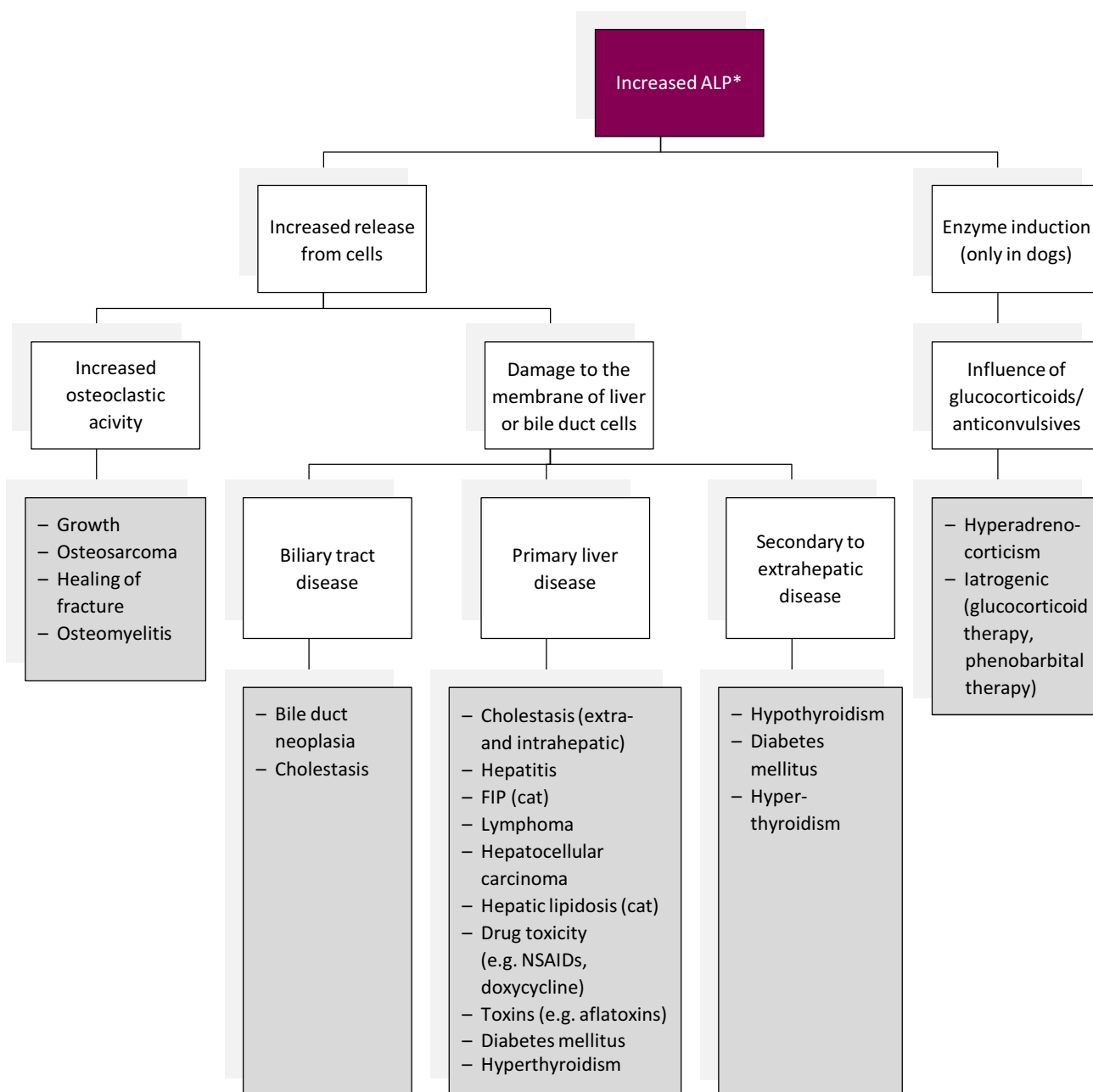
* Eosinopenia is not clinically relevant



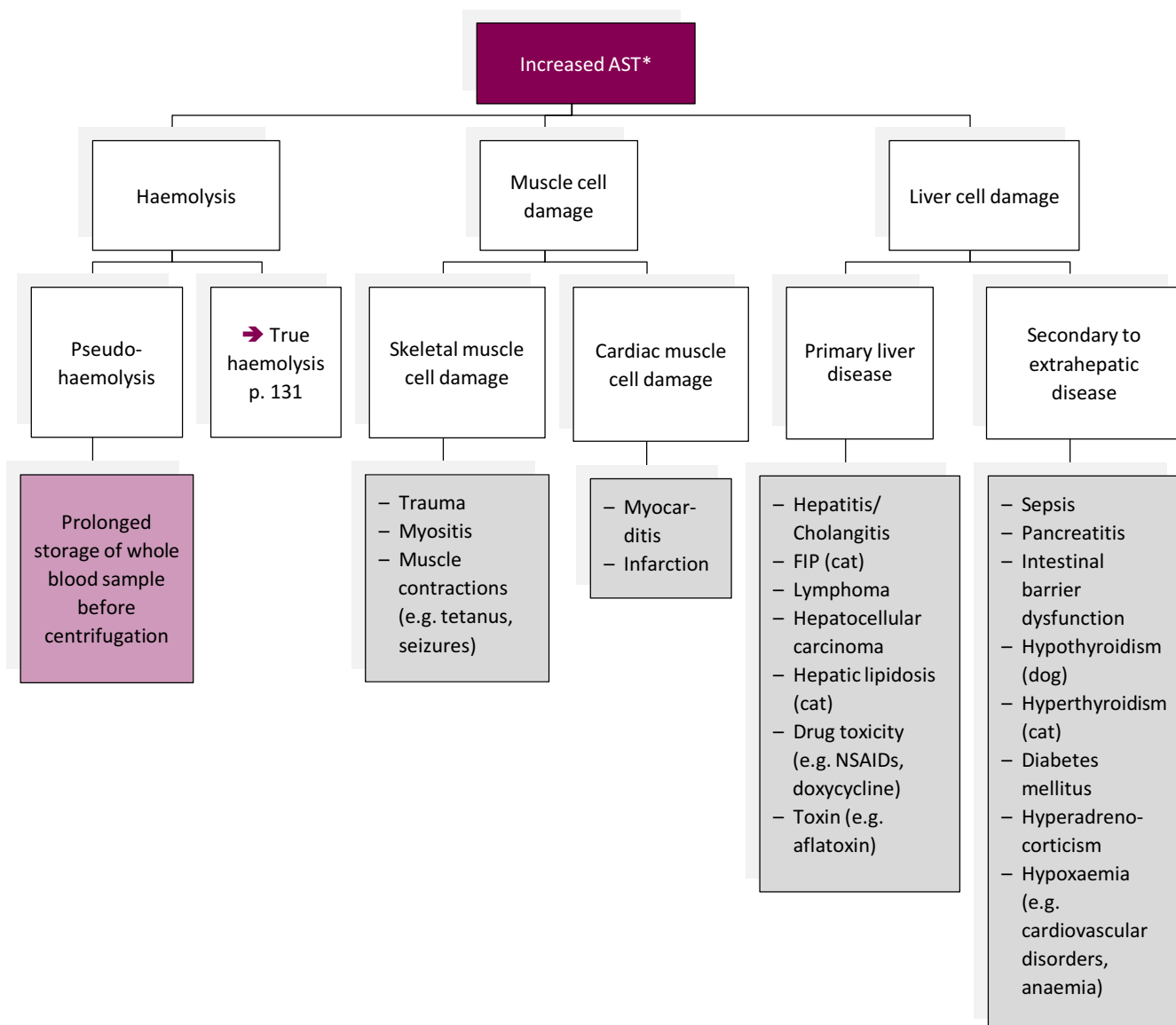
* Basopenia is not clinically relevant



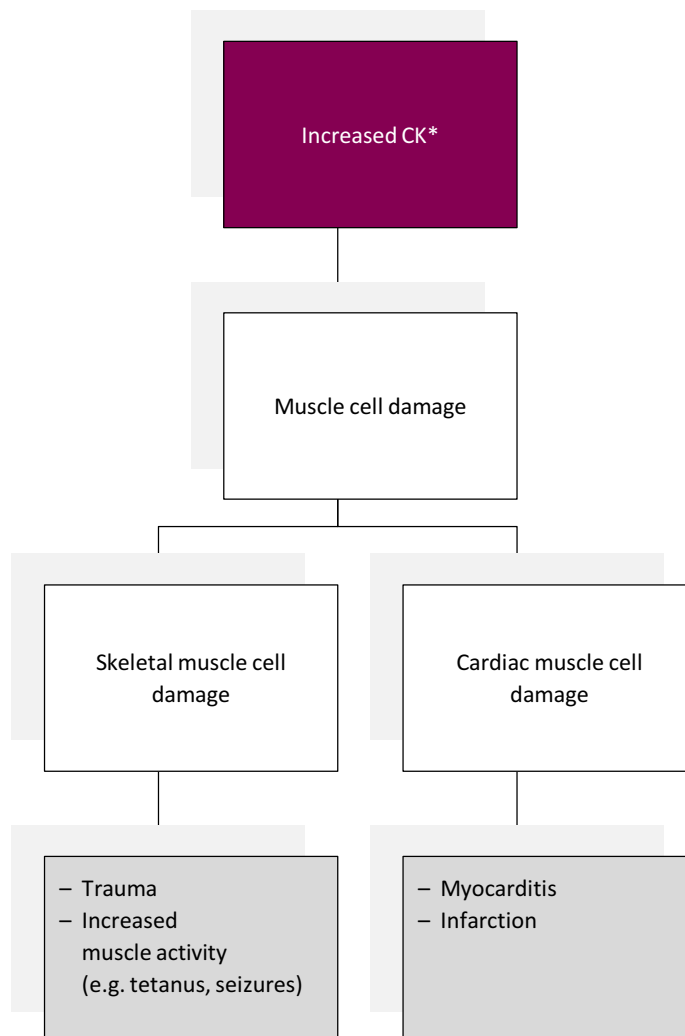
* Decreased ALT activity is not clinically relevant



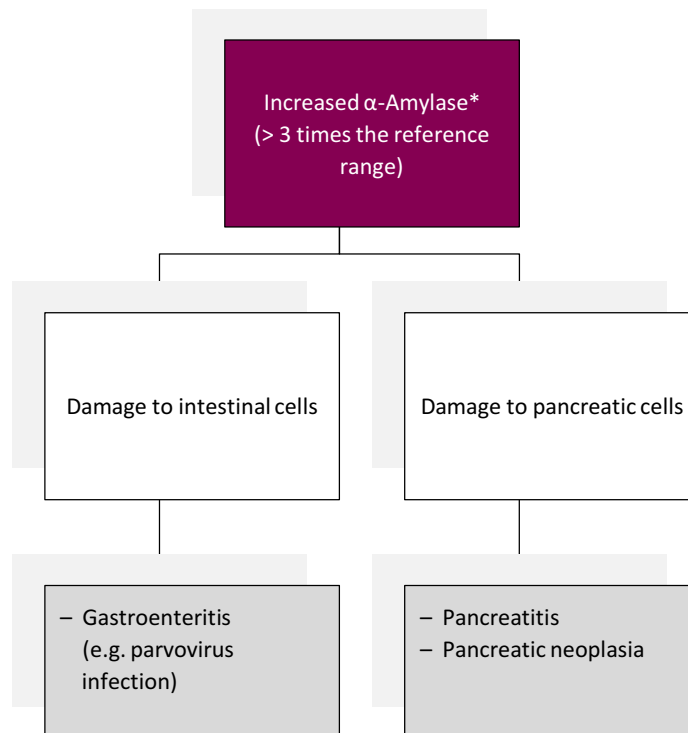
* Decreased ALP is not clinically relevant



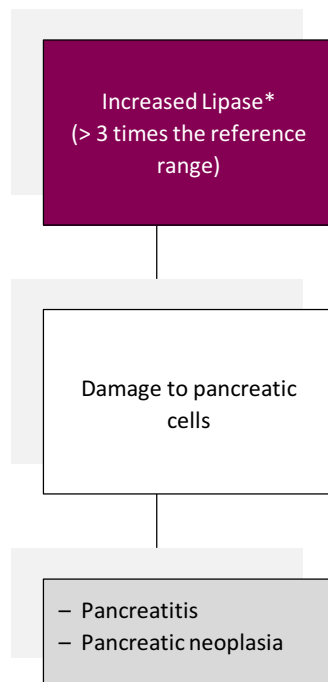
* Decreased AST activity is not clinically relevant



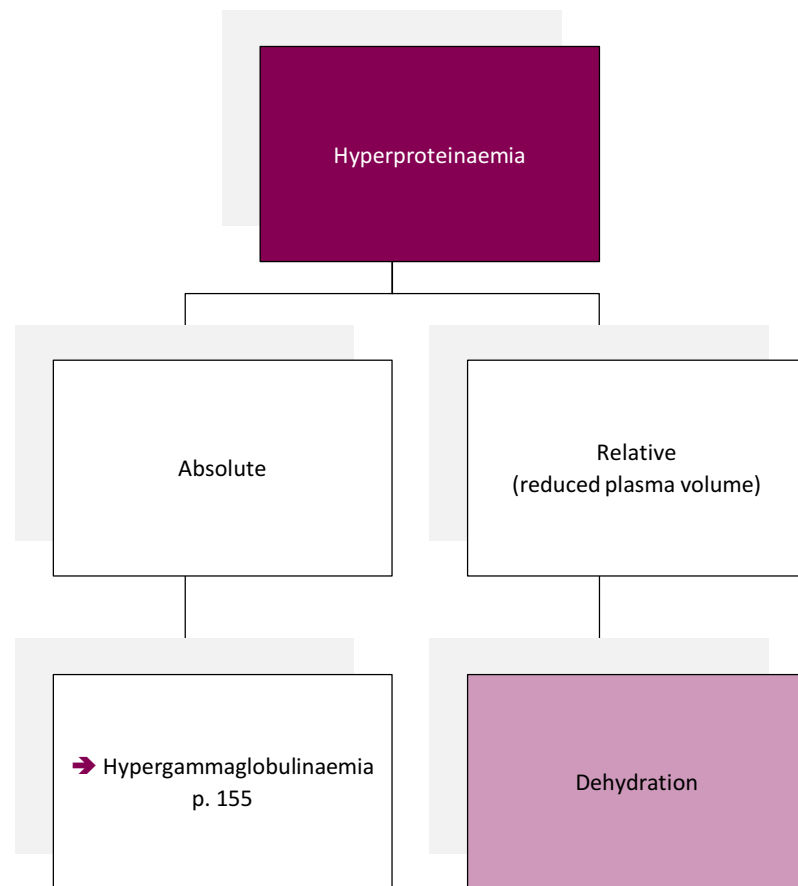
* Decreased CK activity is not clinically relevant

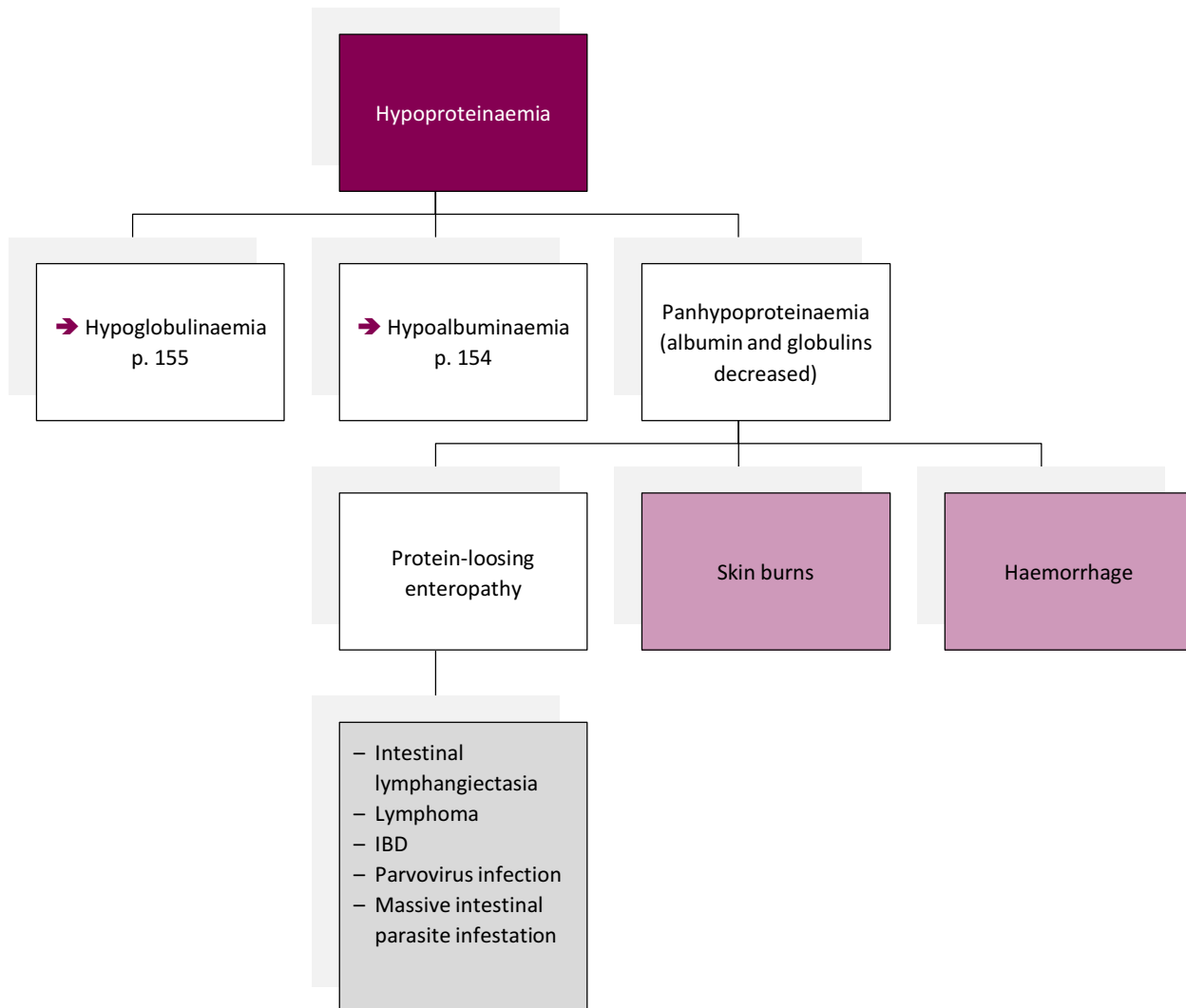


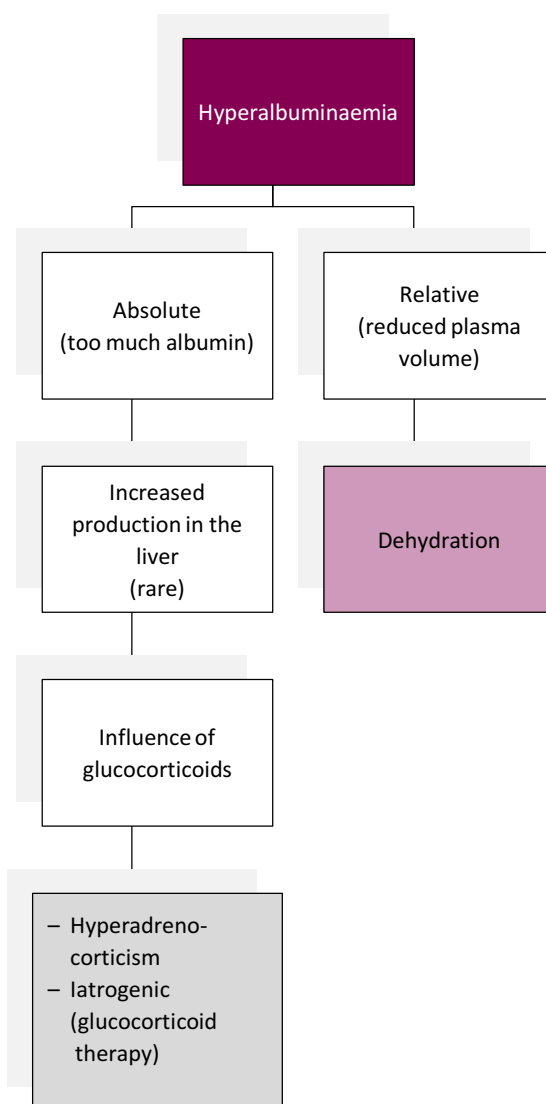
* Decreased α-Amylase activity is not clinically relevant

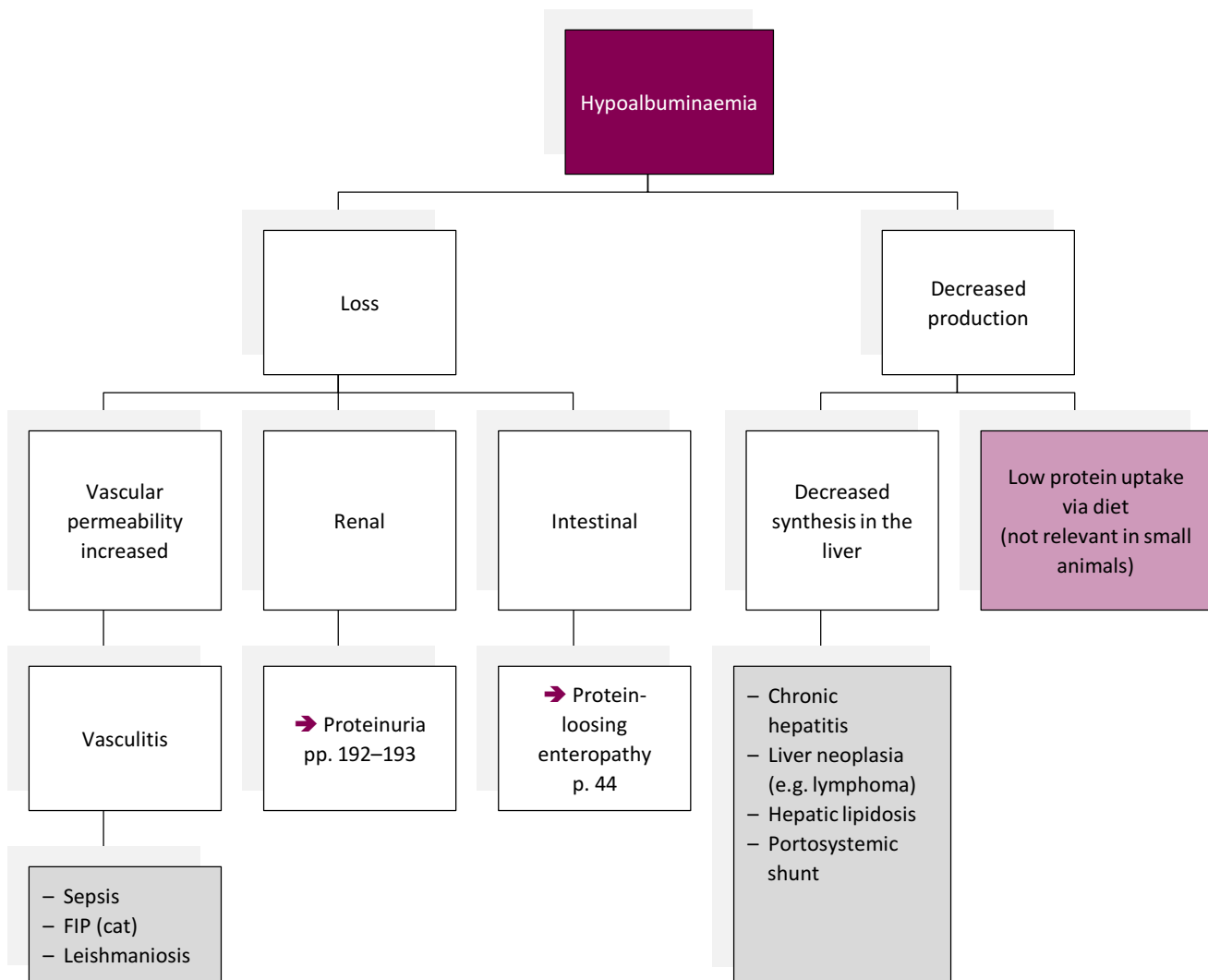


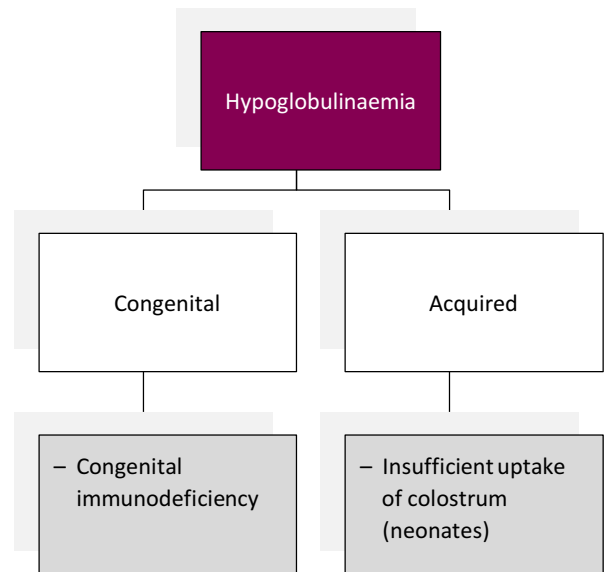
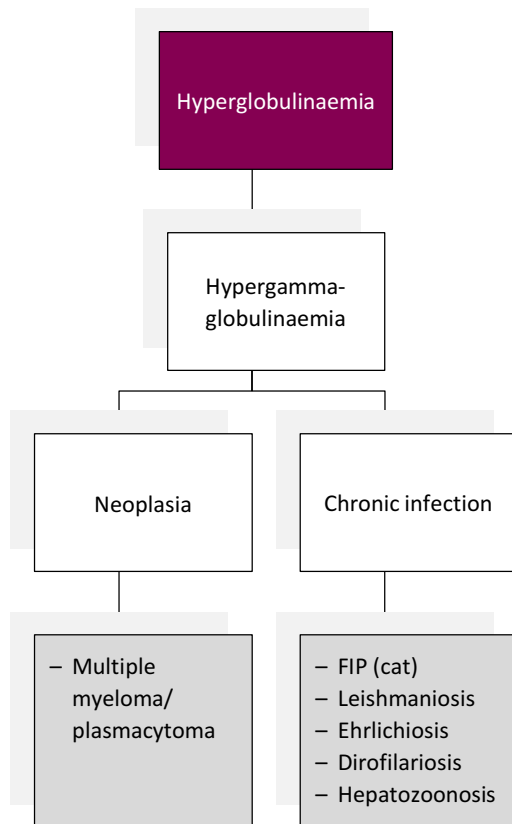
* Decreased lipase activity is not clinically relevant

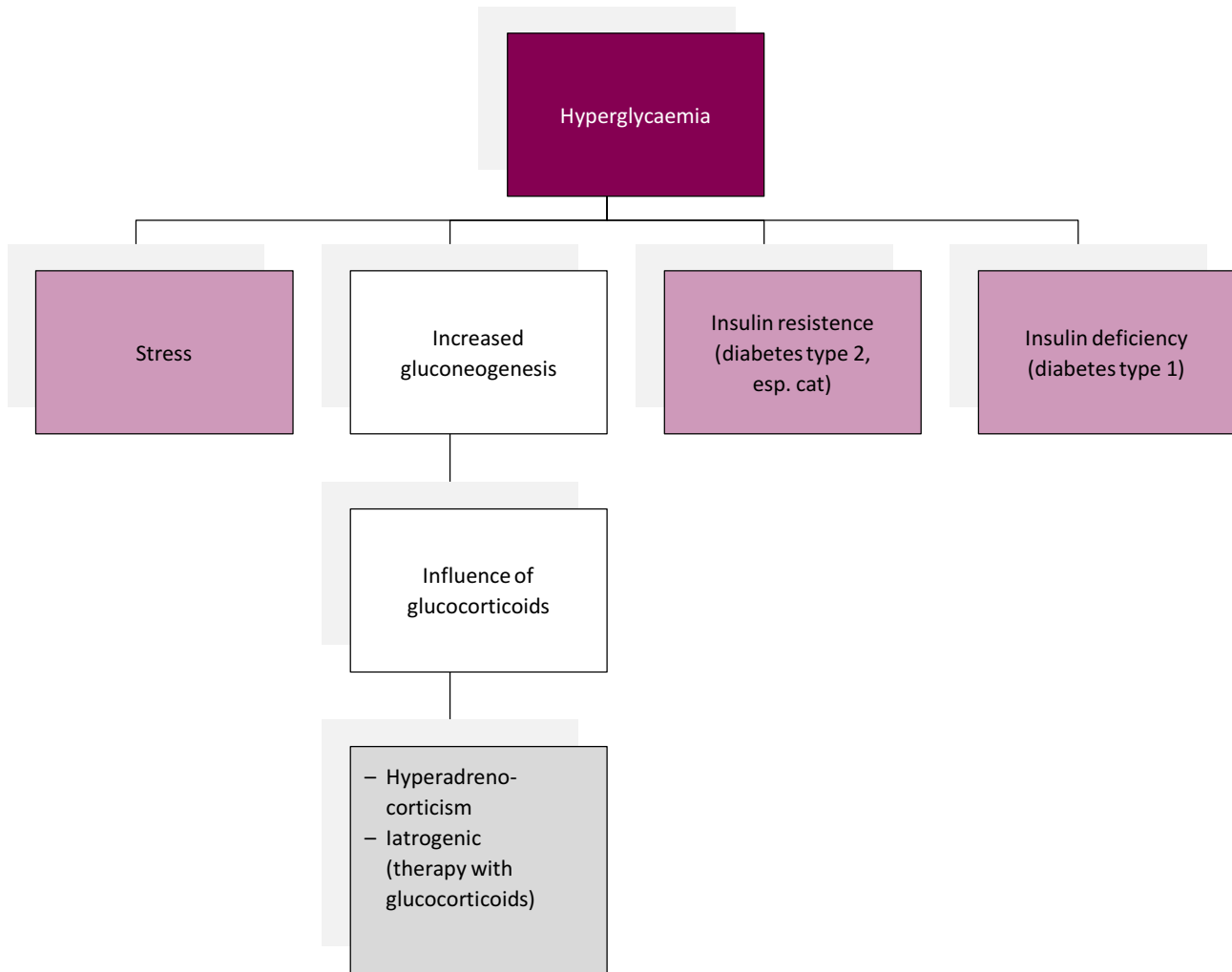


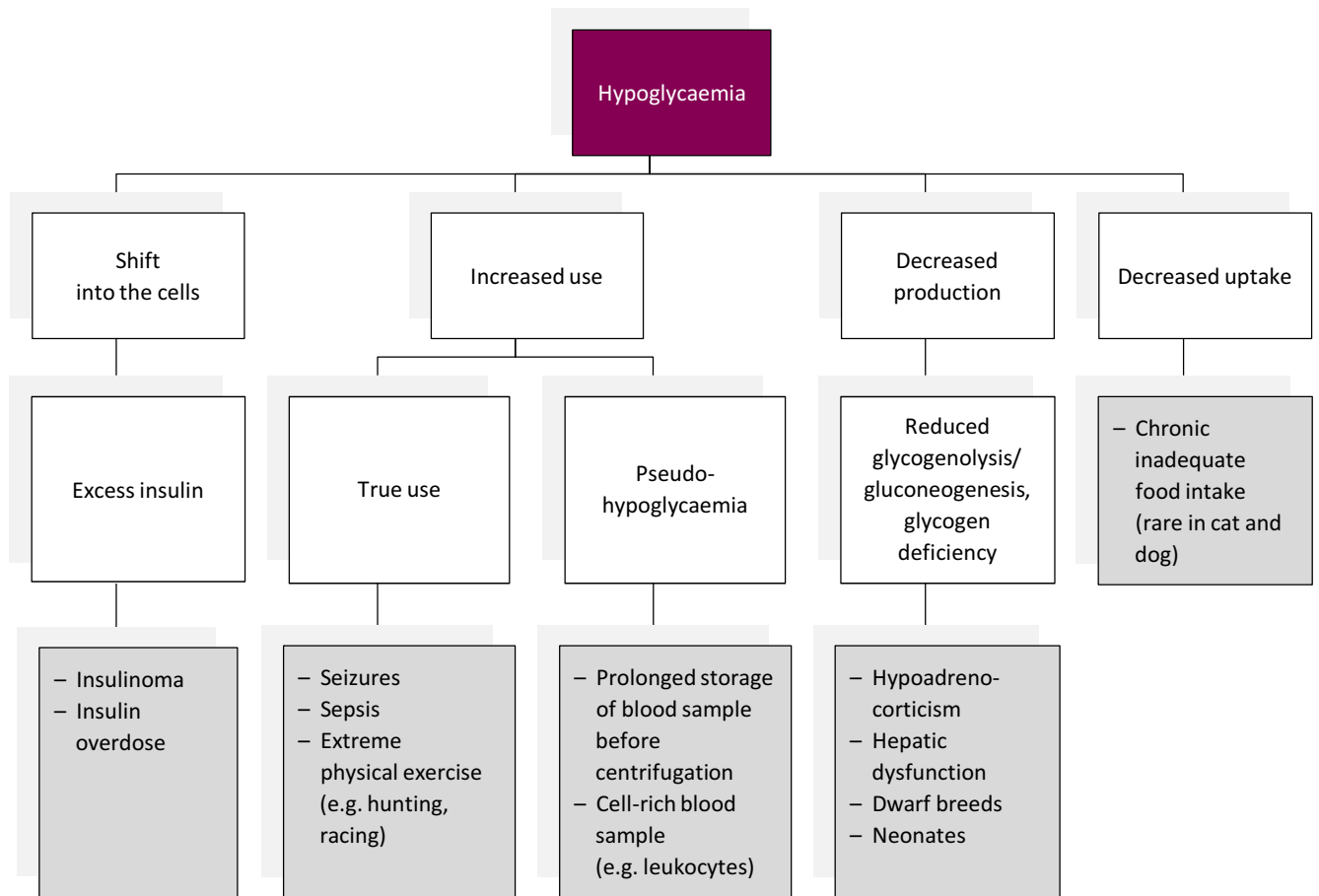


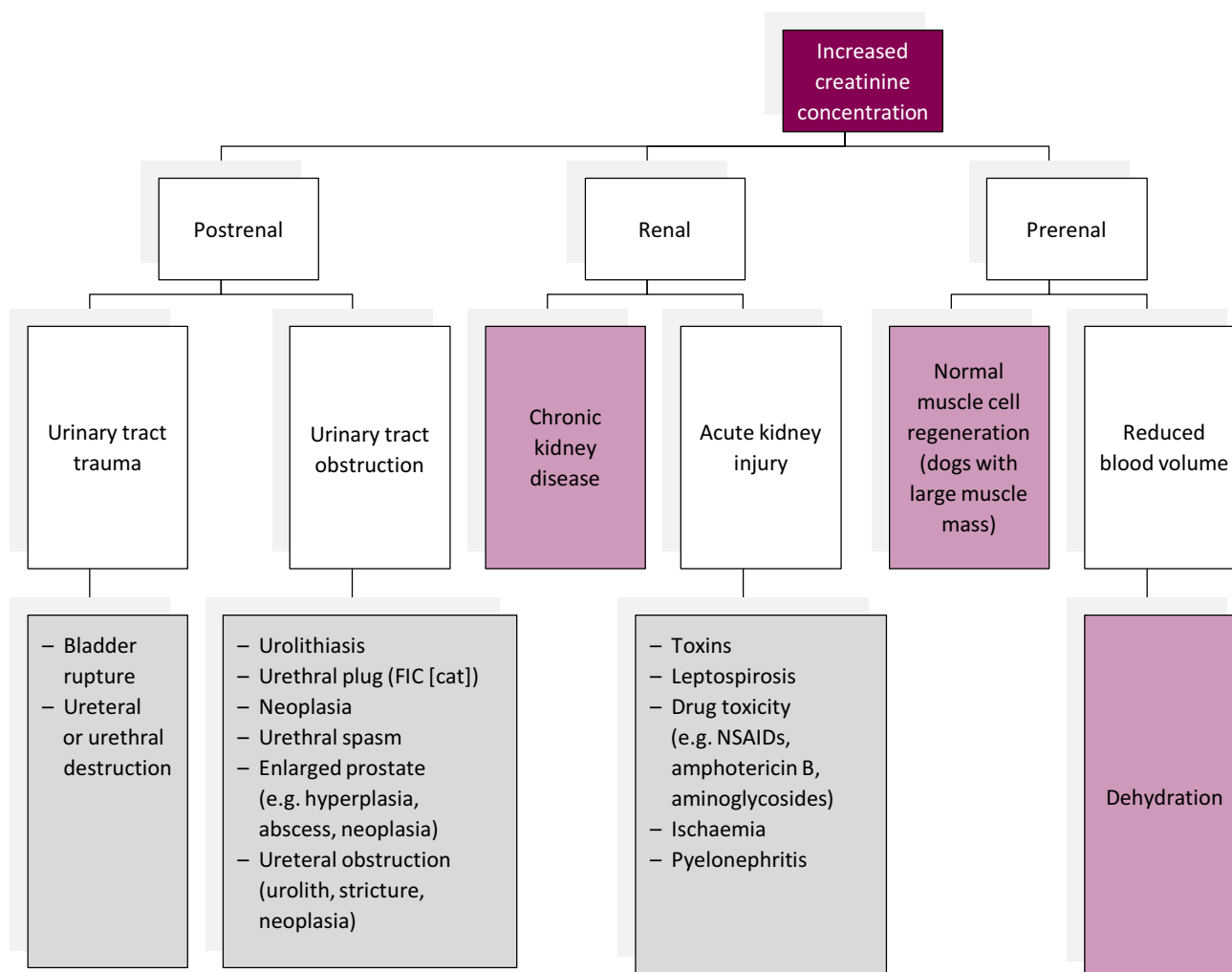


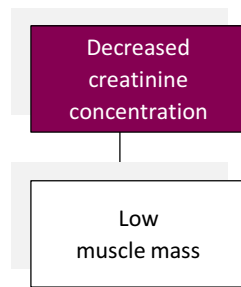


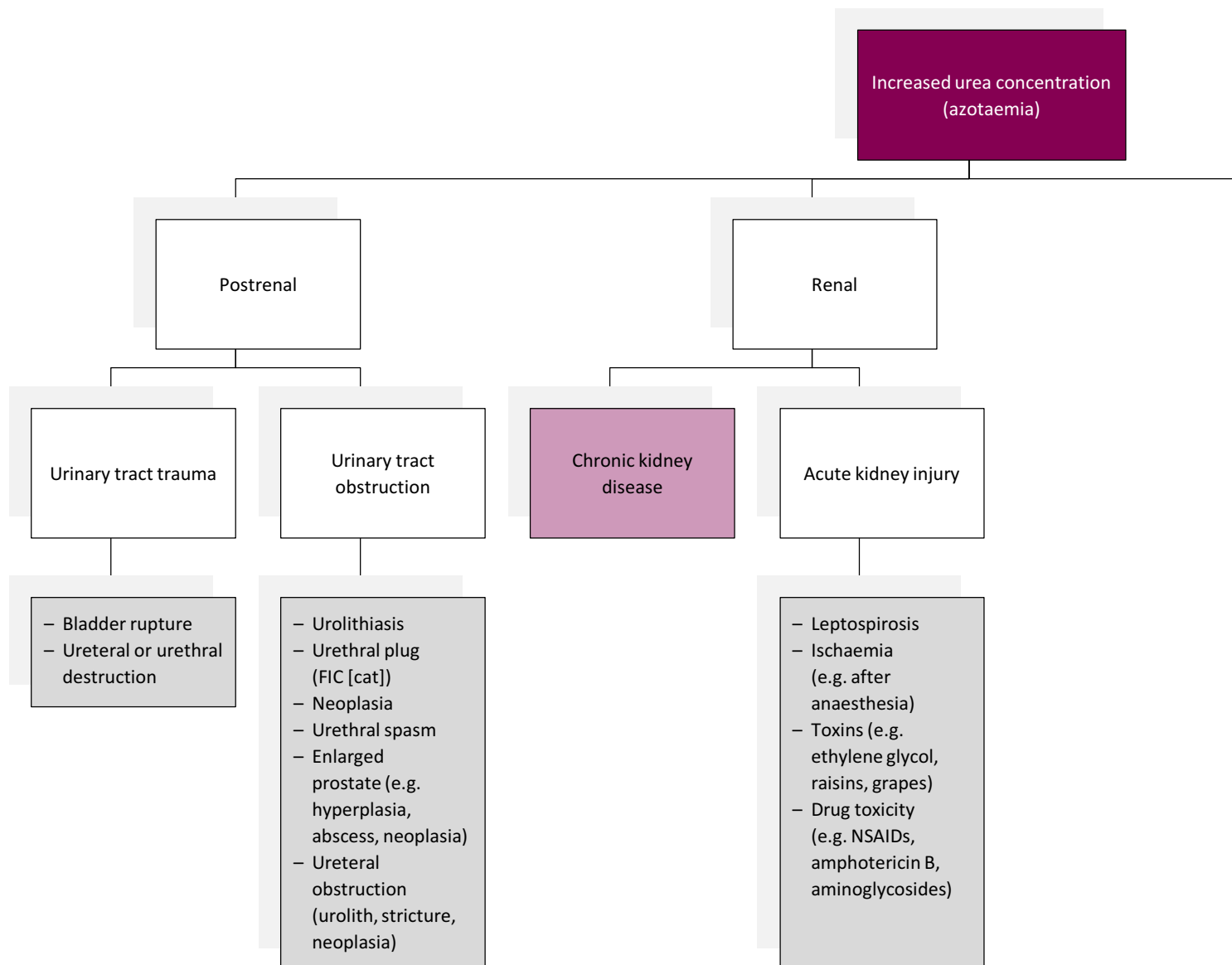


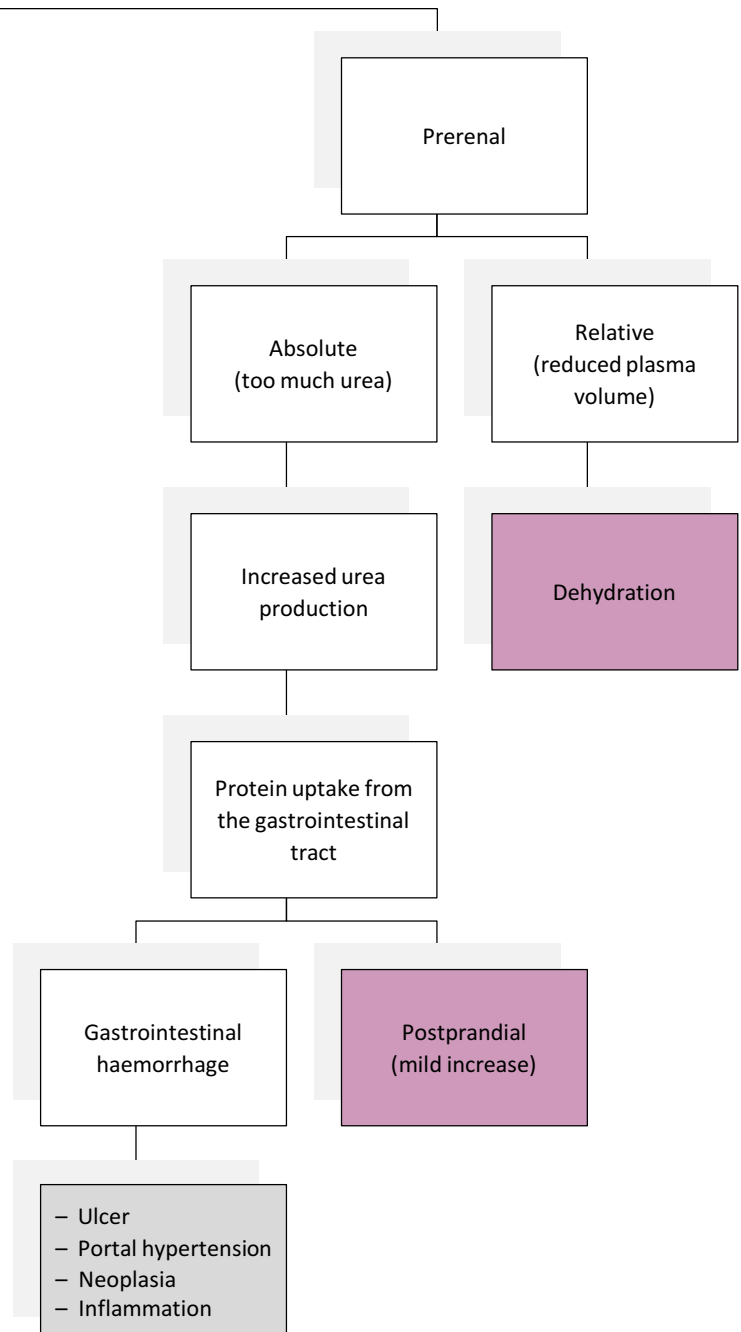


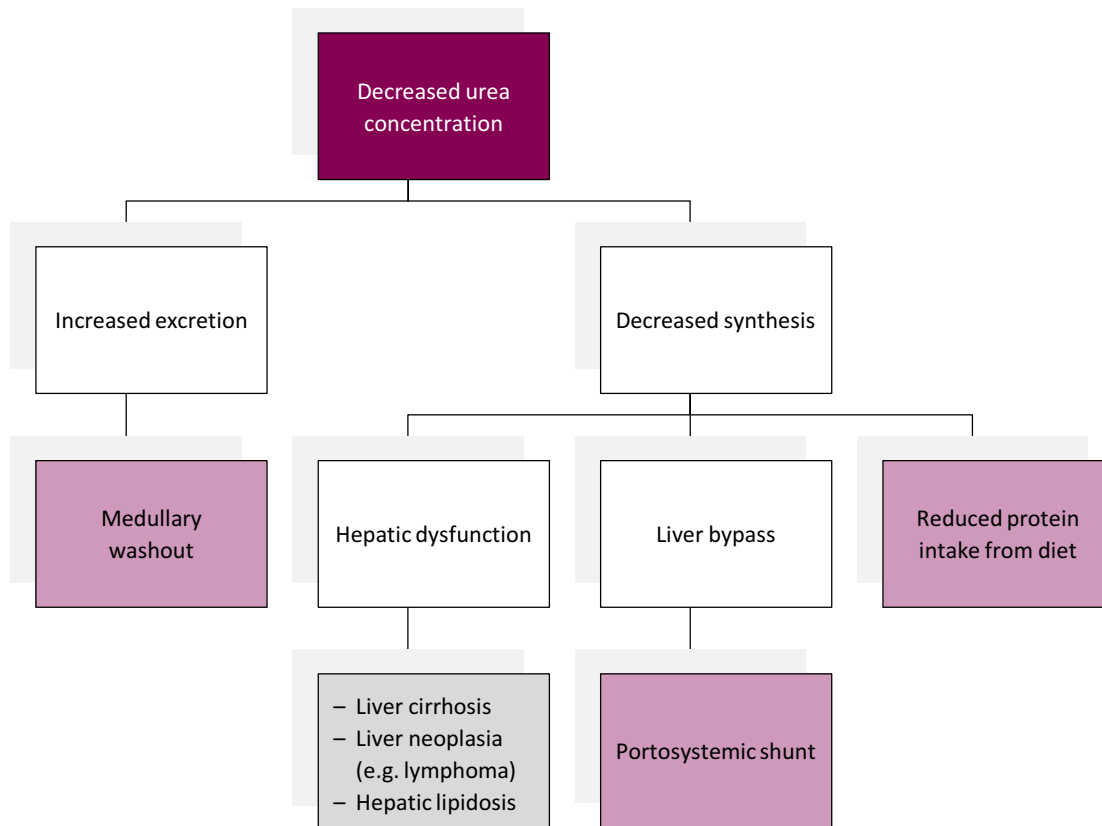


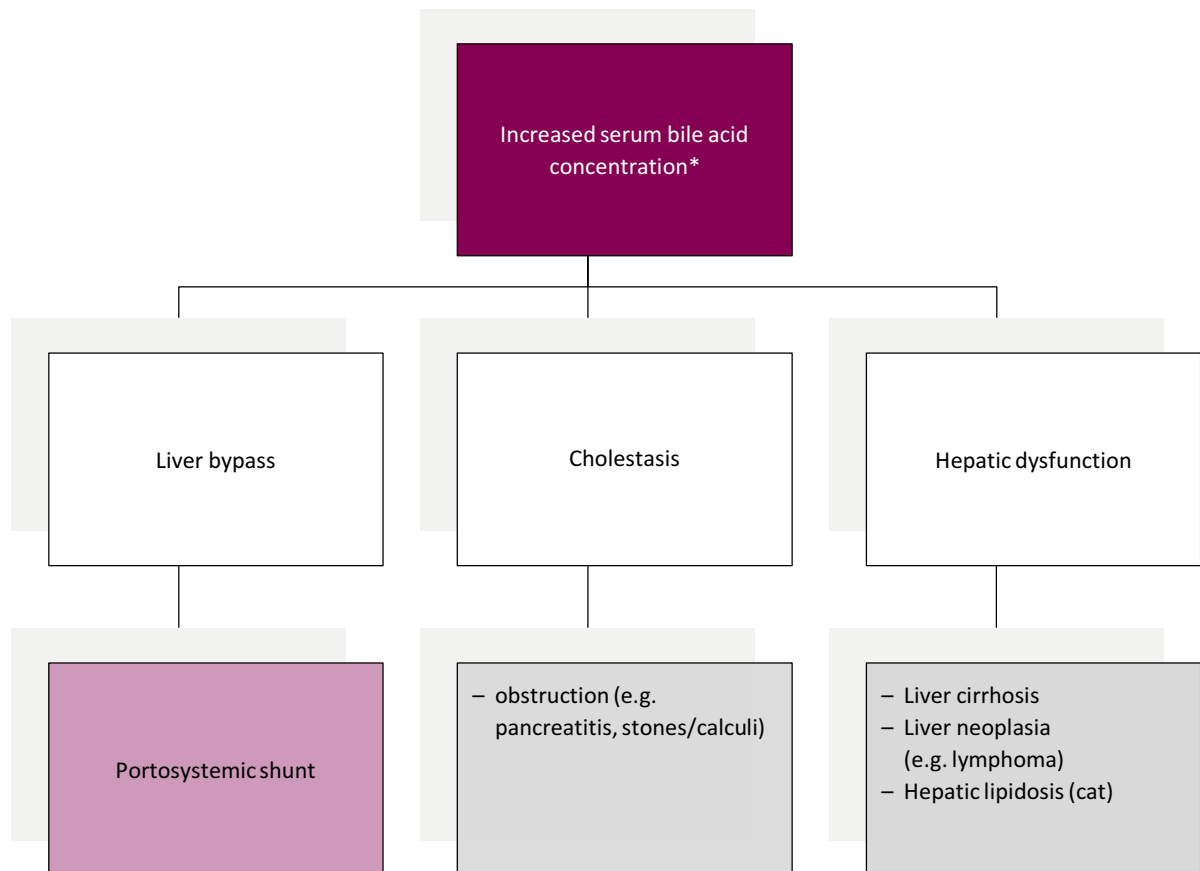




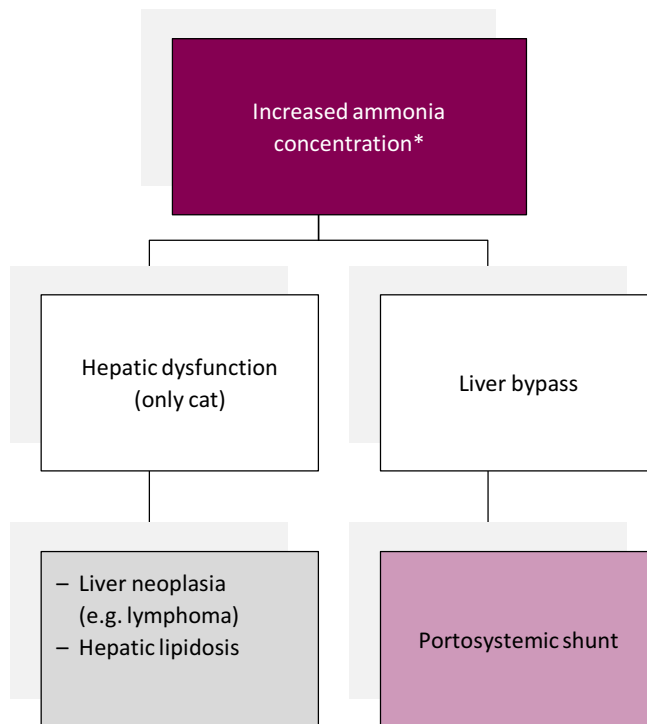




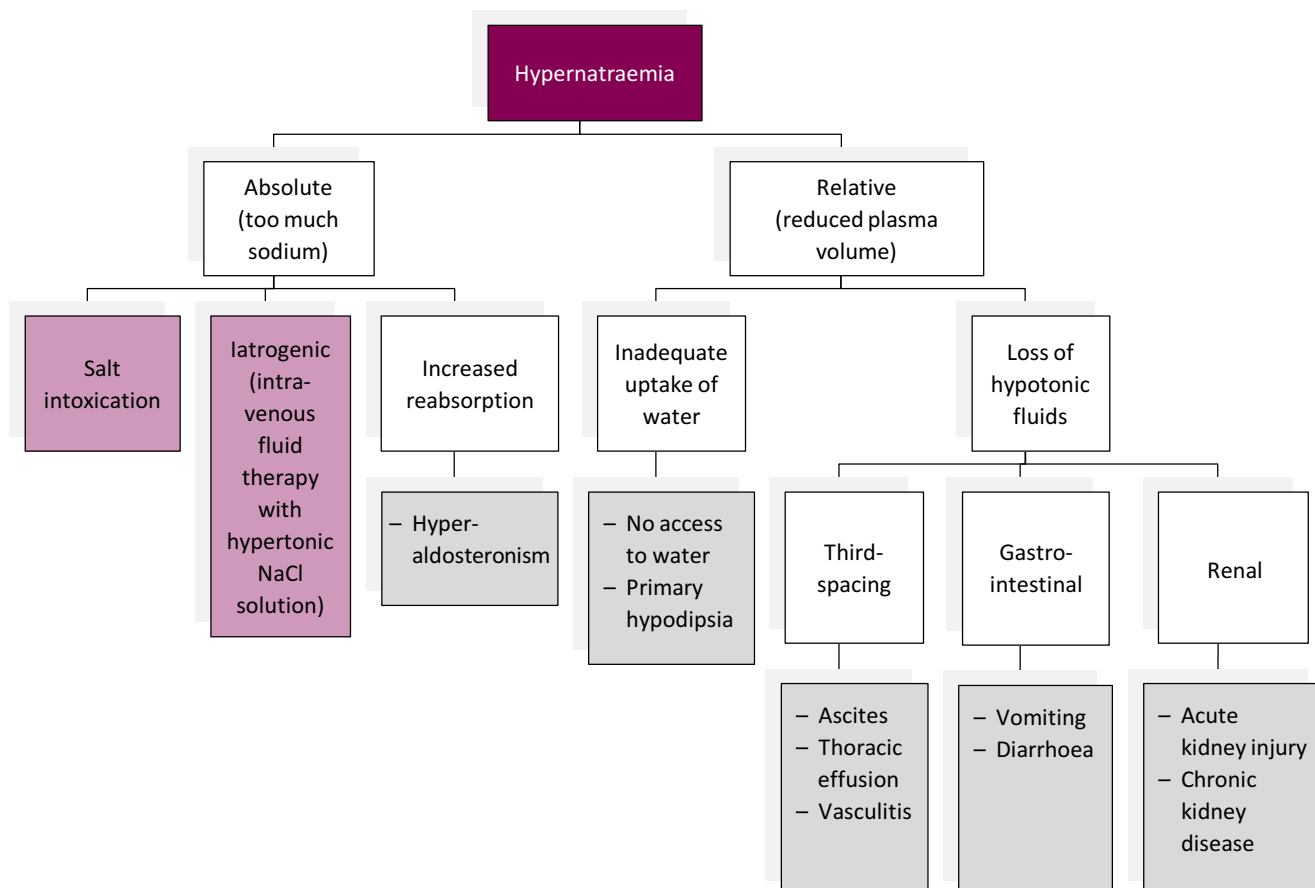


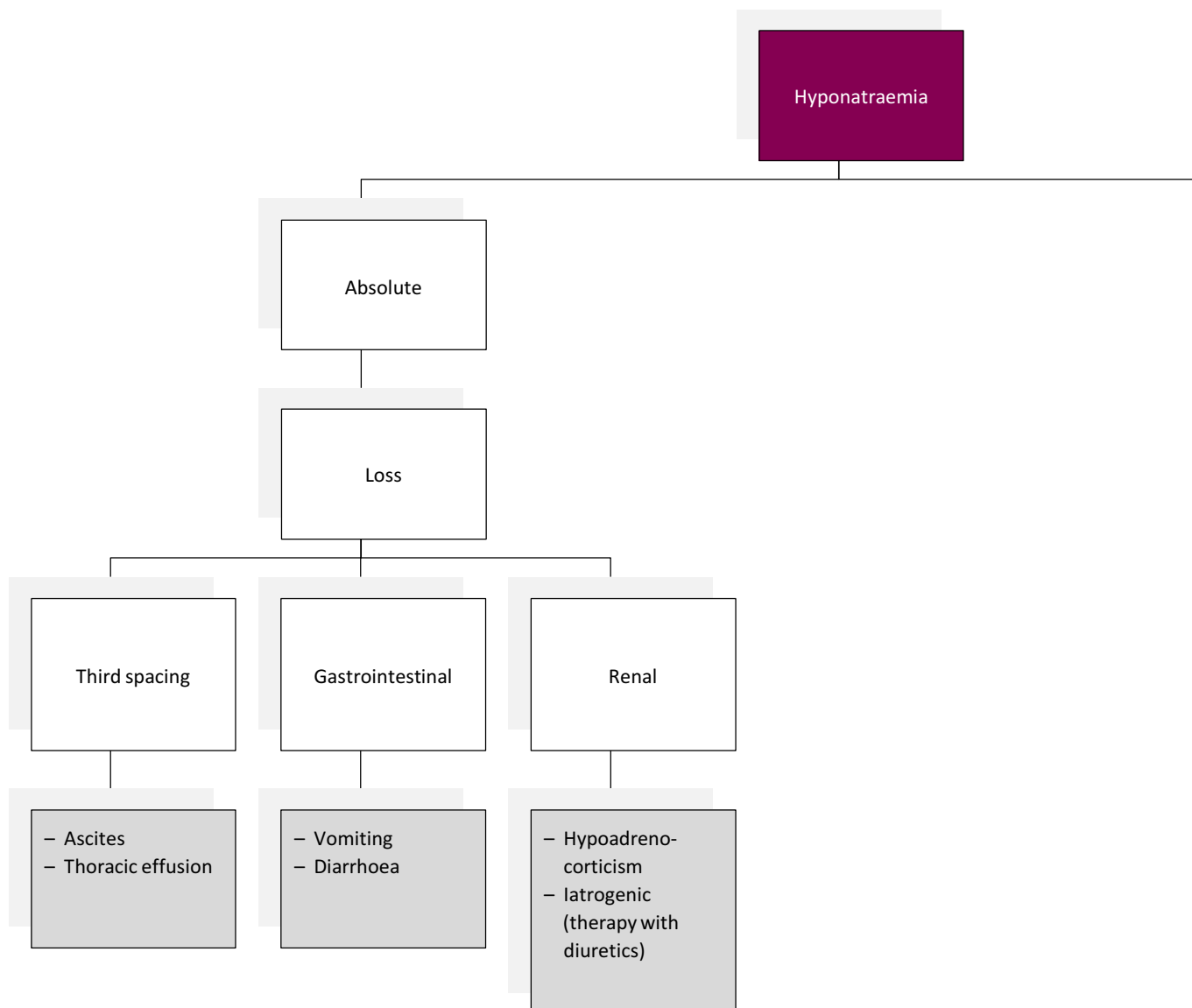


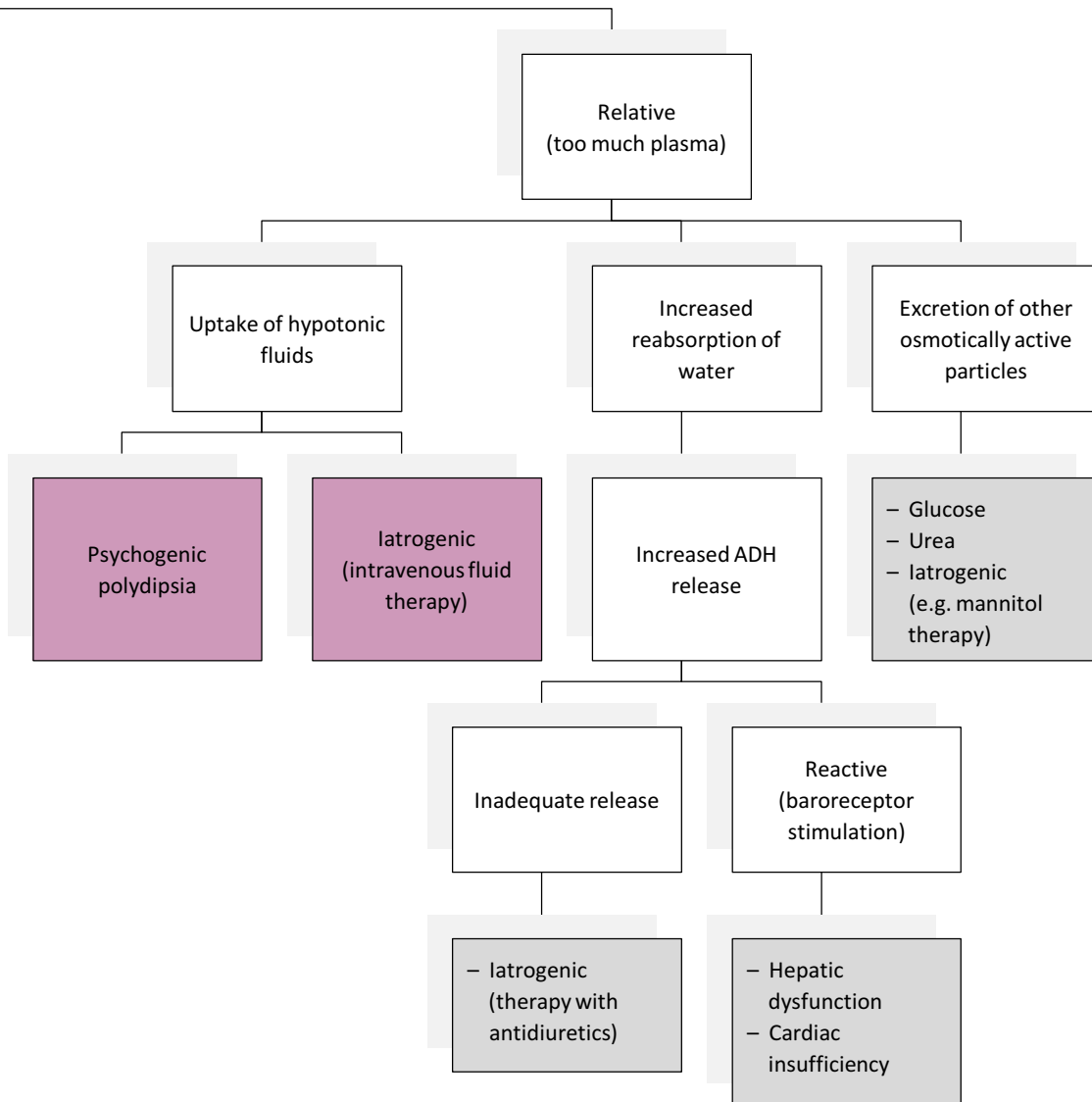
* Decreased serum bile acid concentration is not clinically relevant

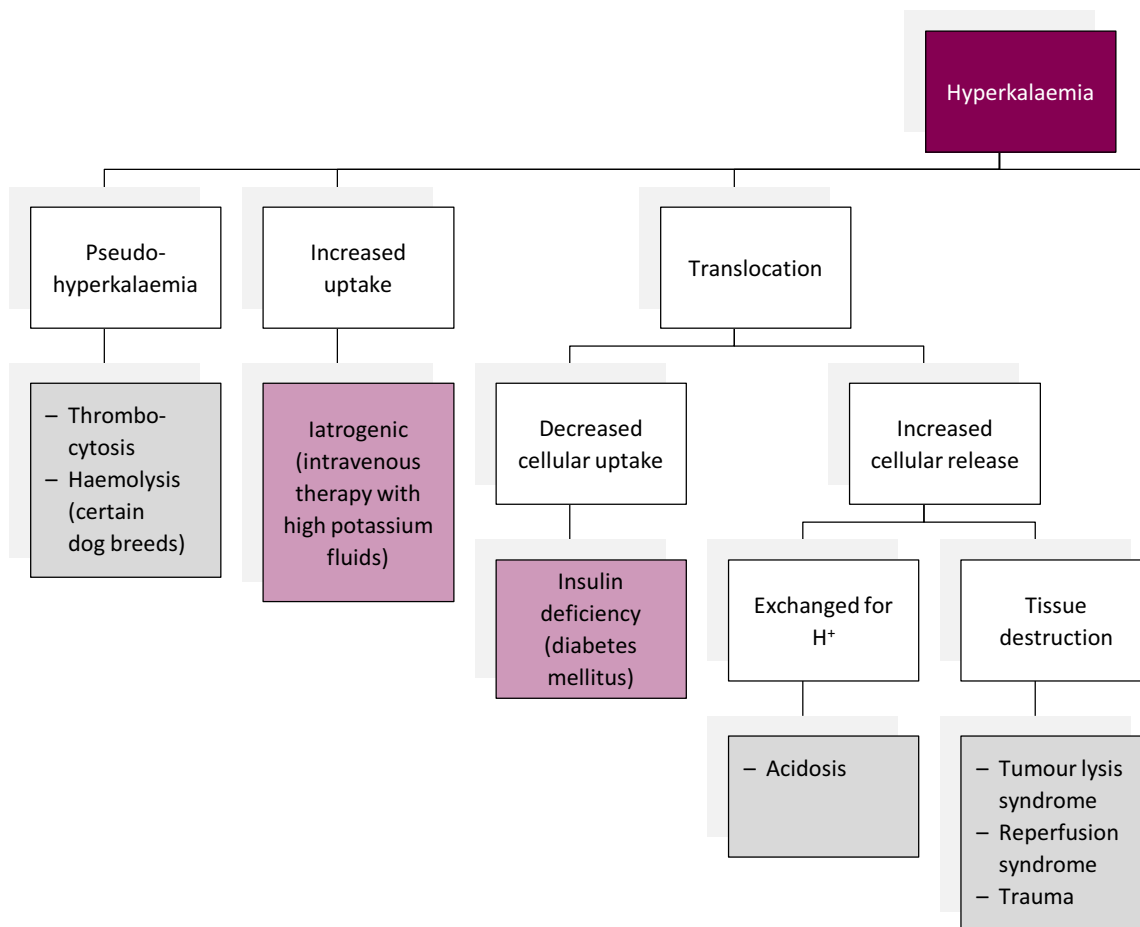


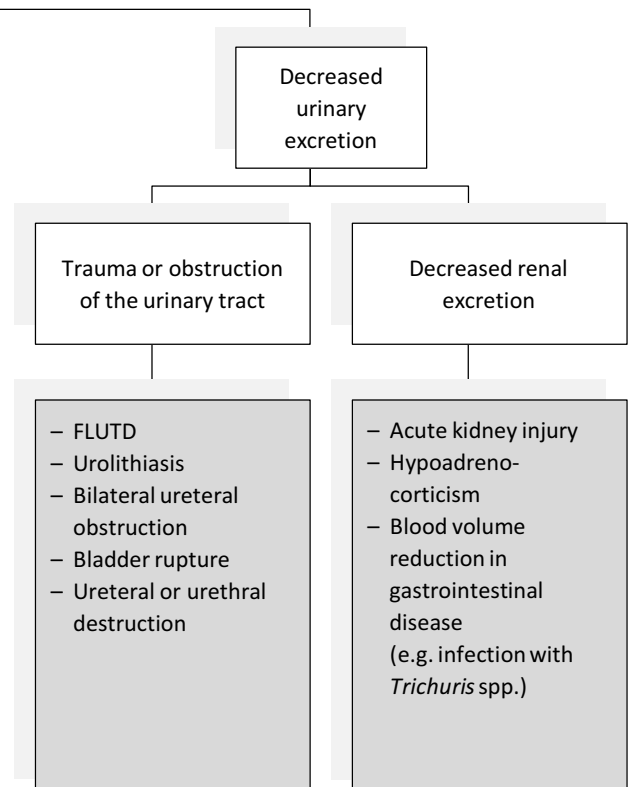
* Decreased blood ammonia concentration is not clinically relevant

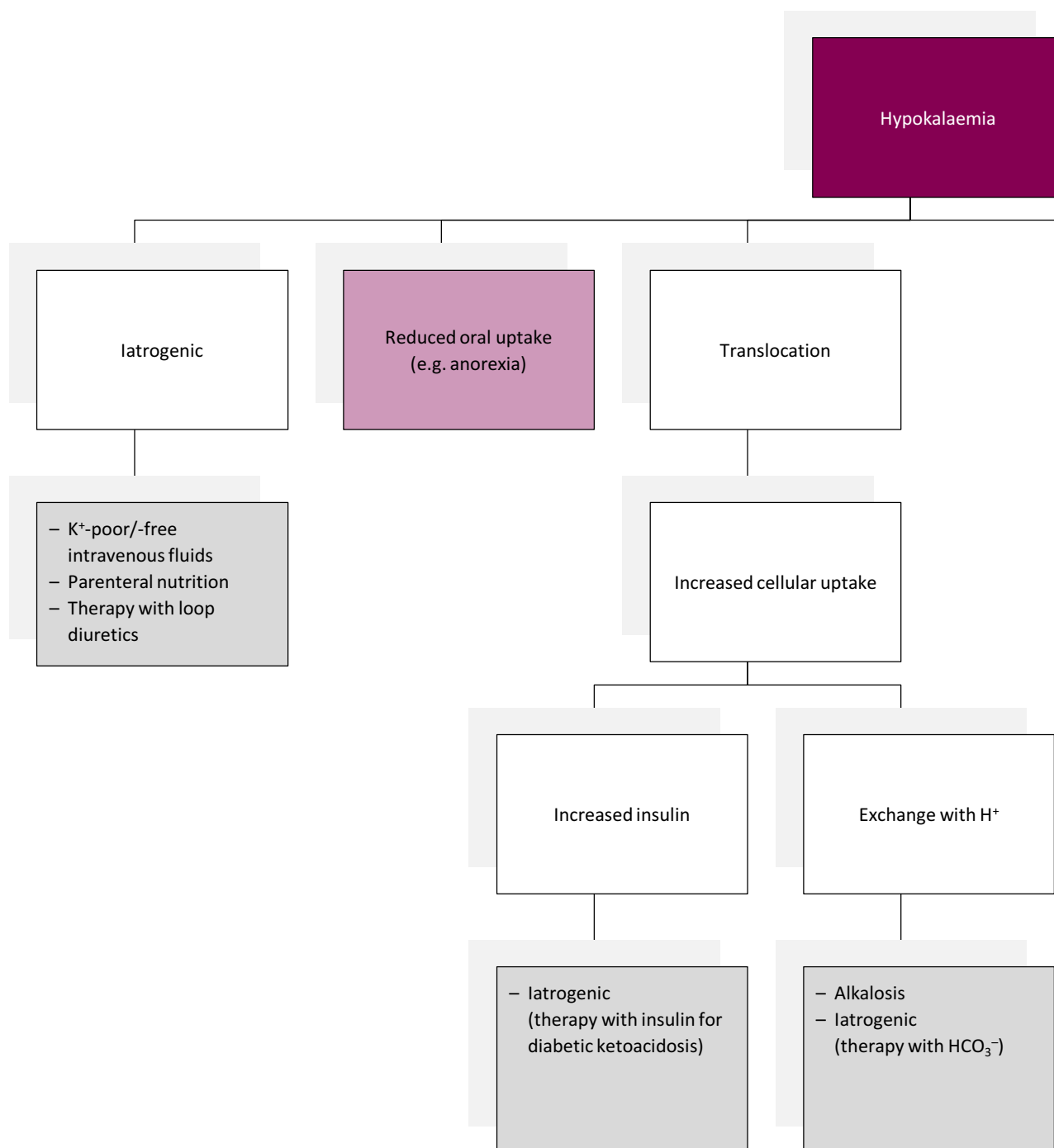


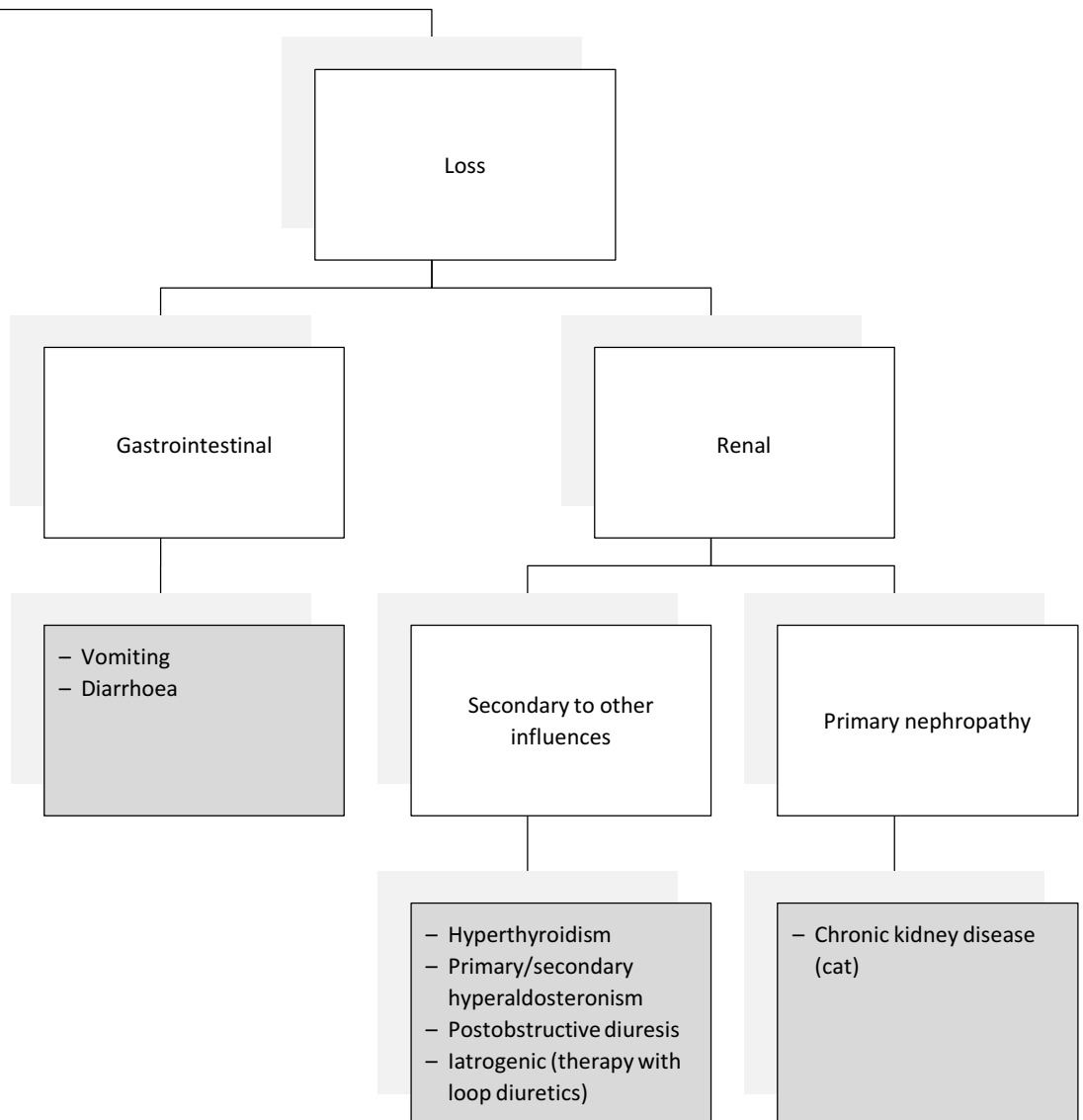


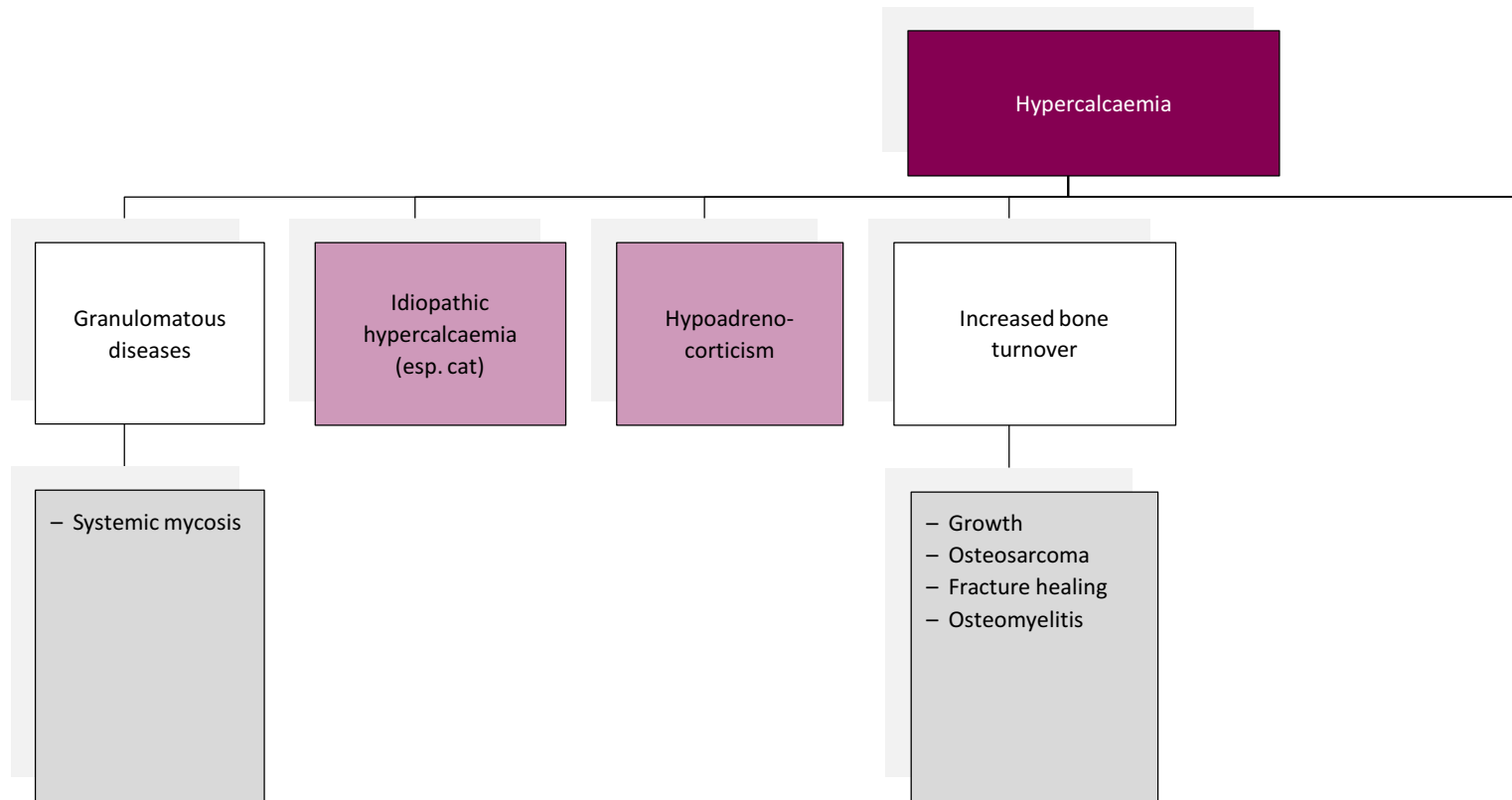


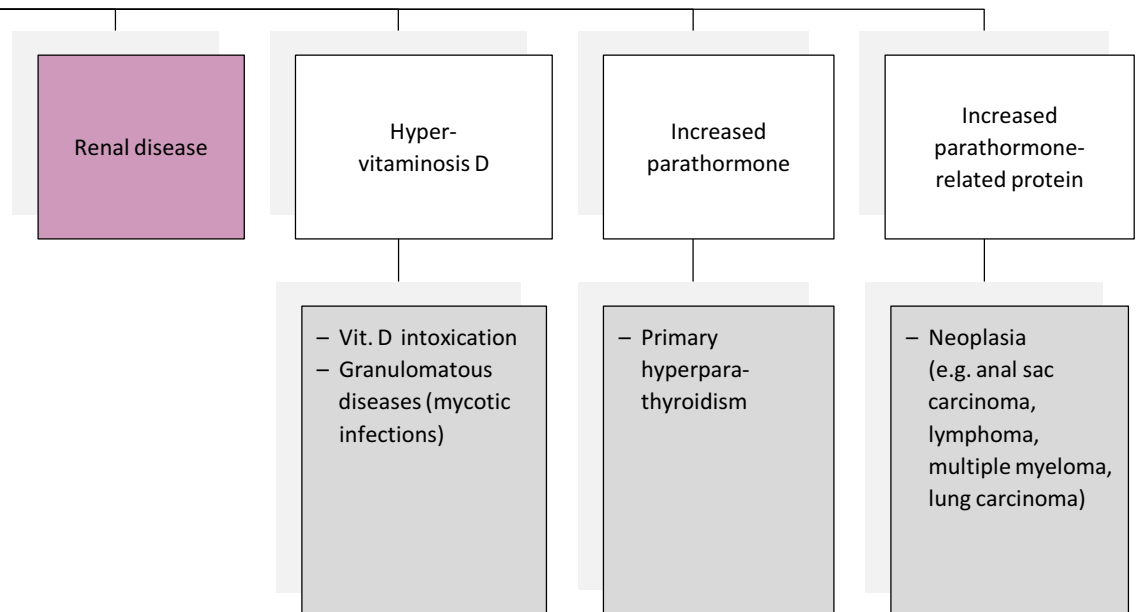


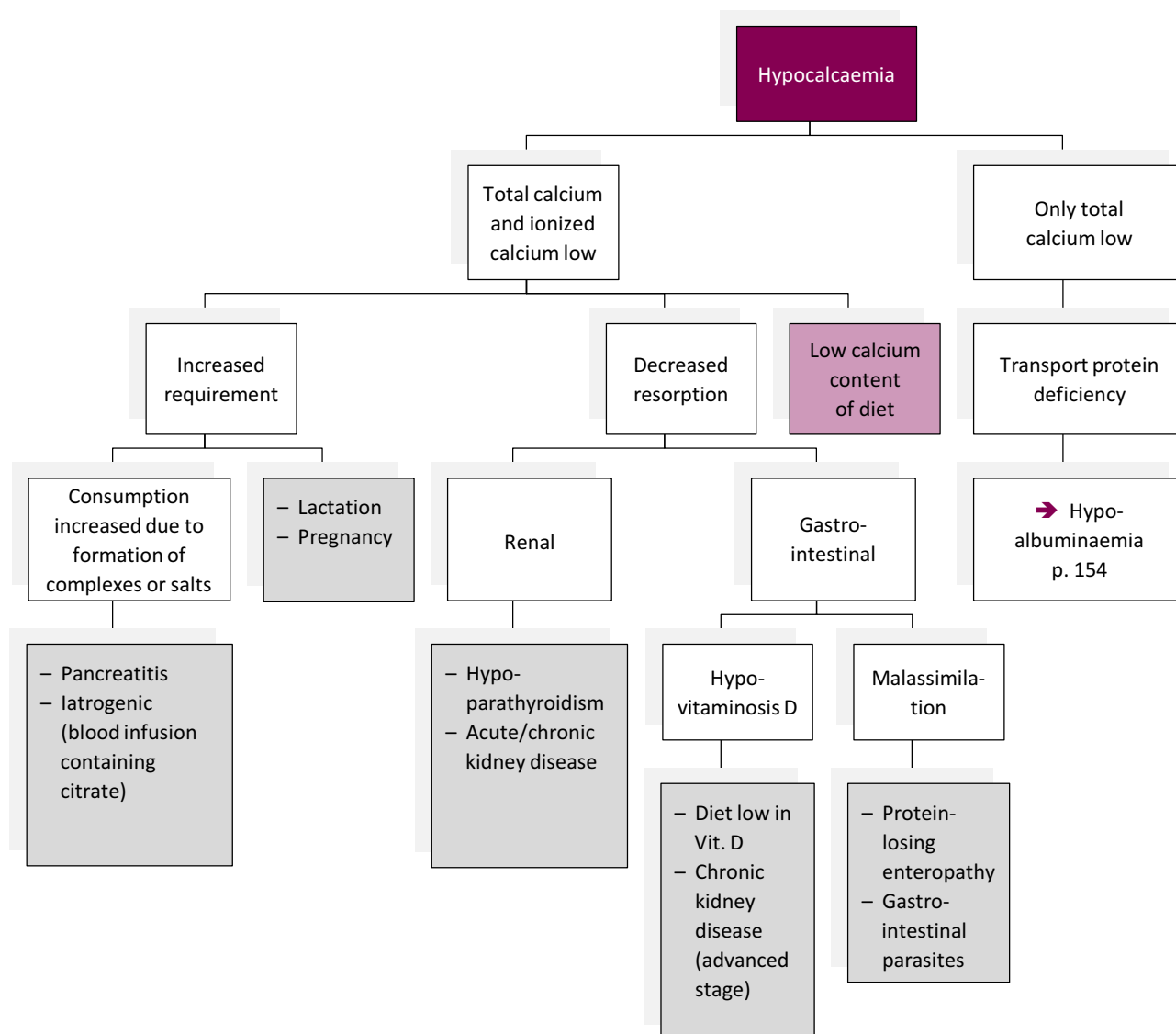


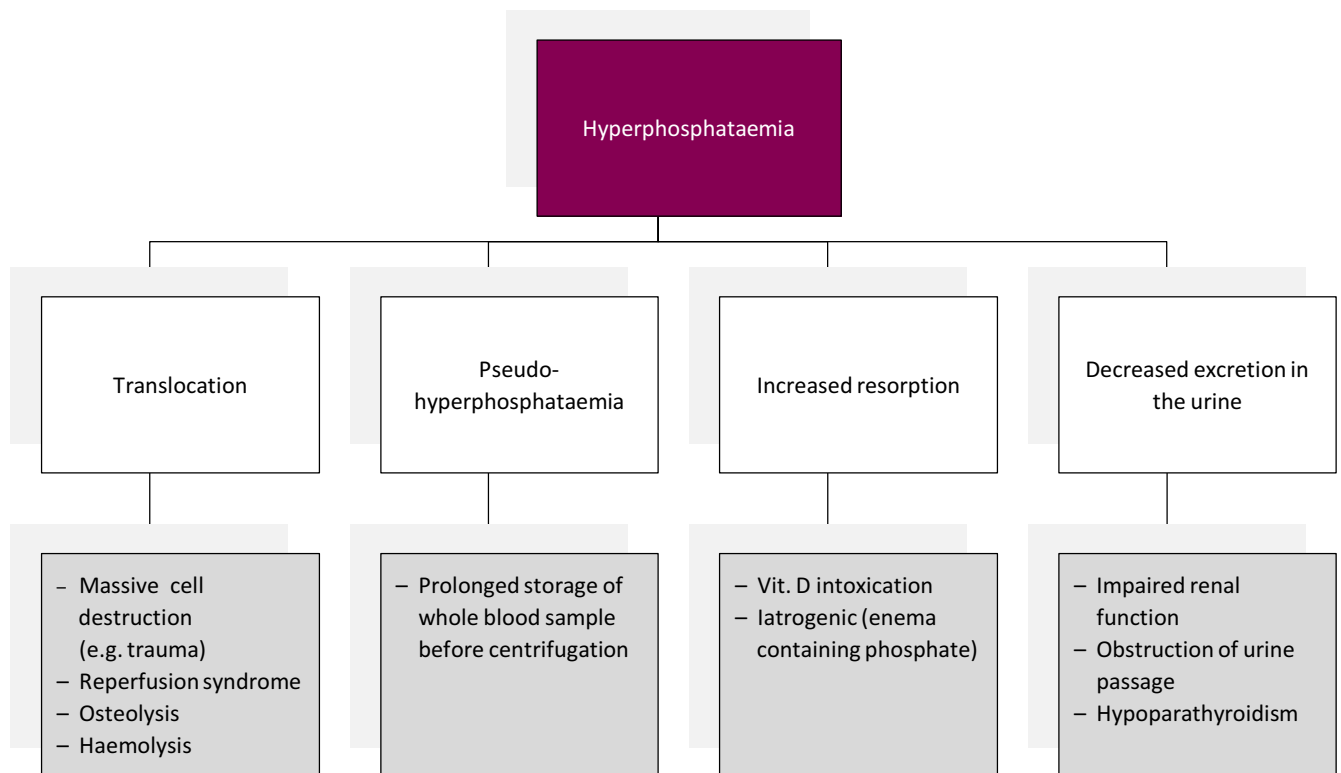


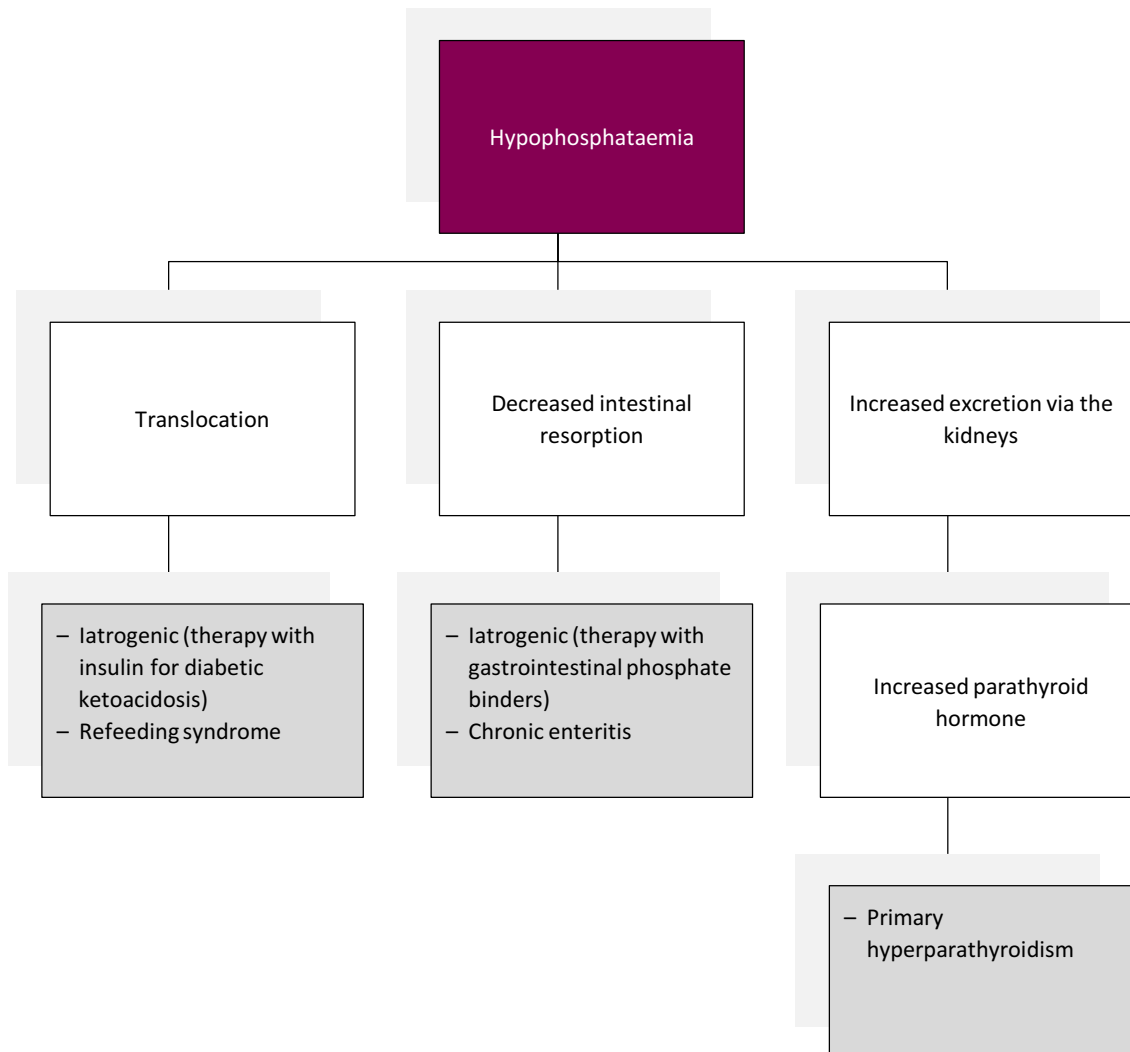


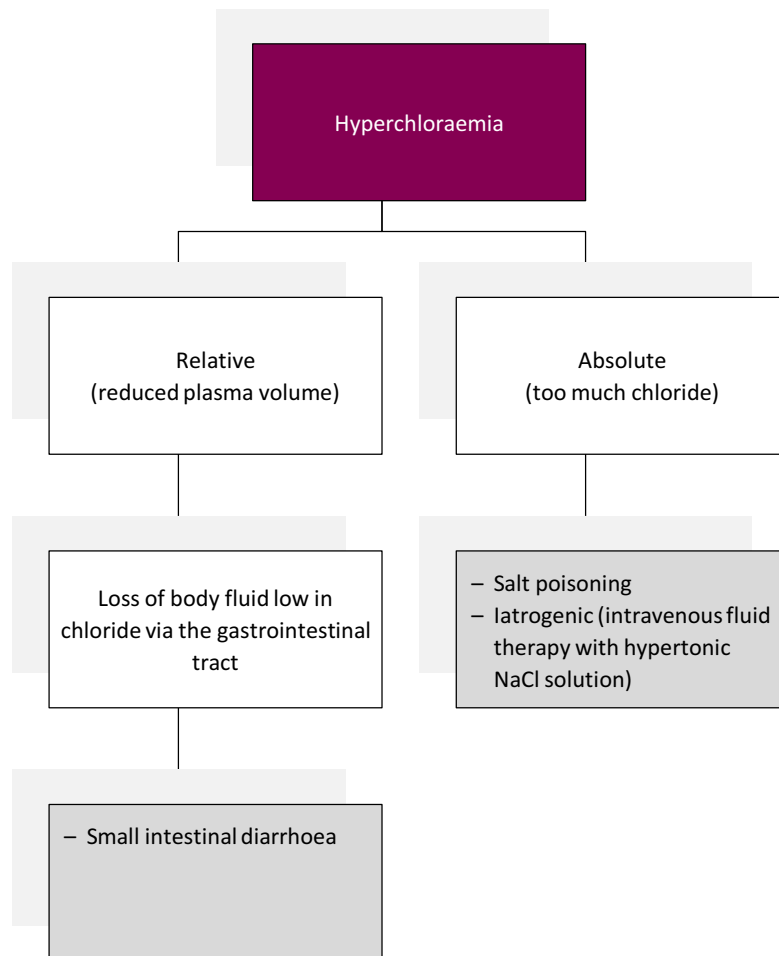


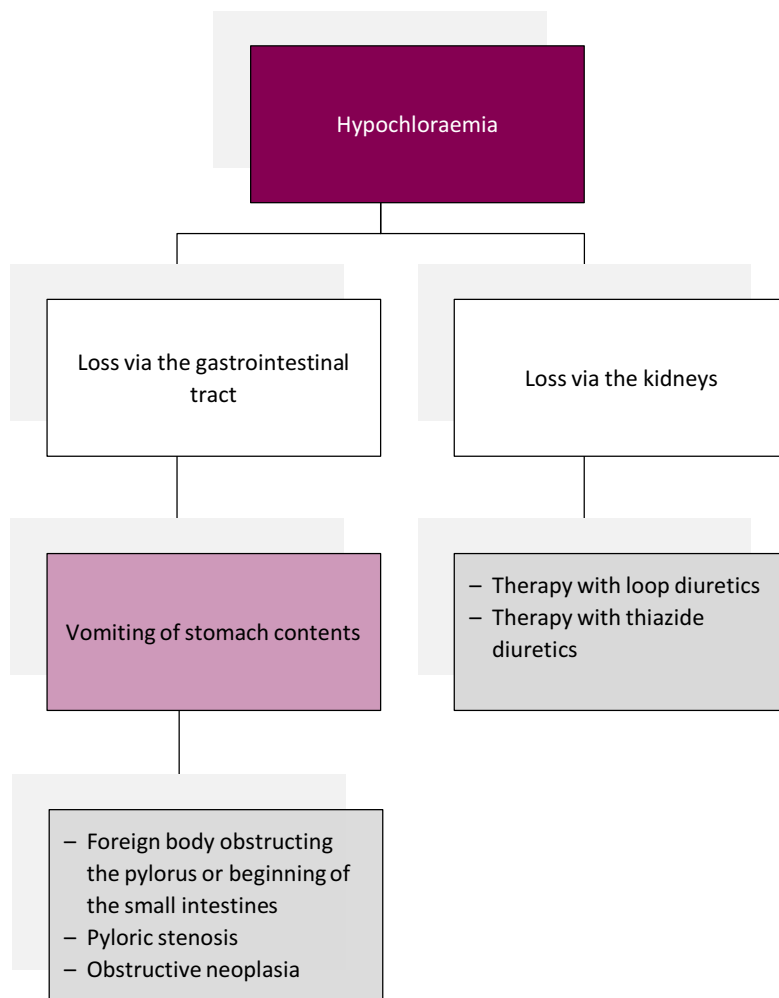


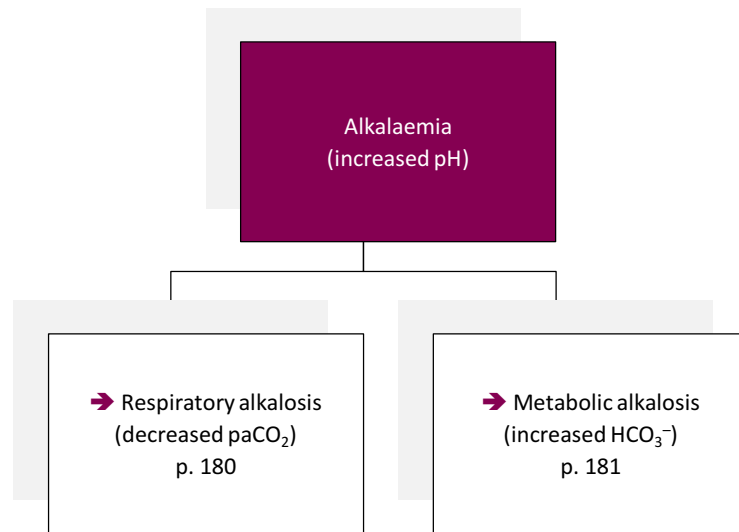


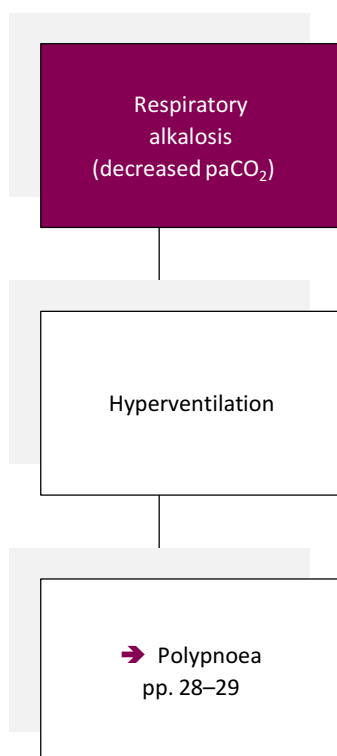


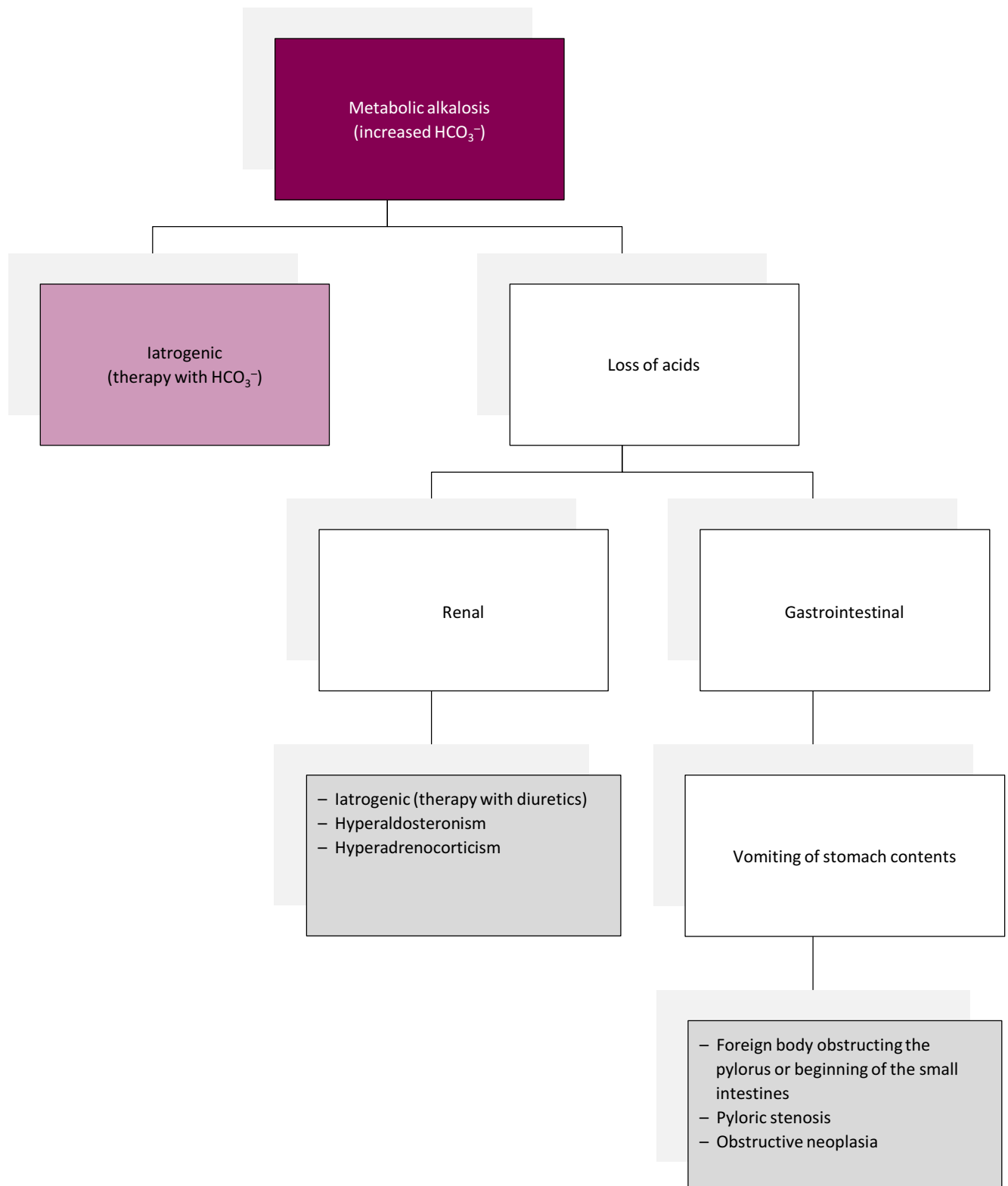


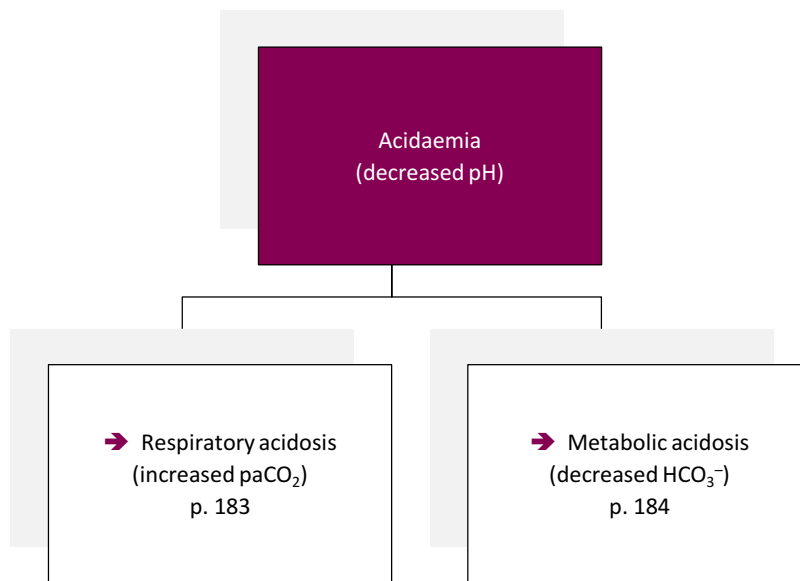


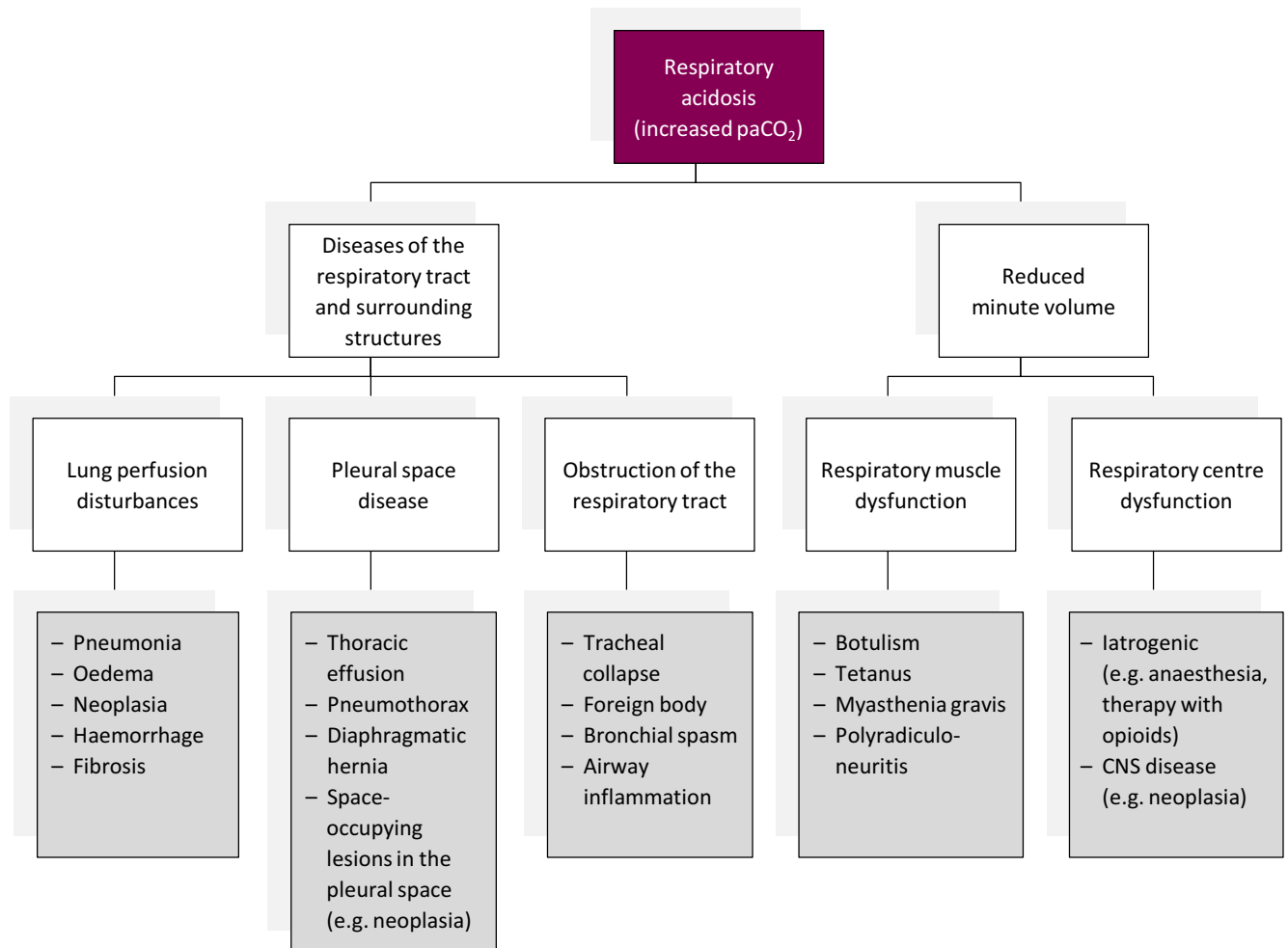


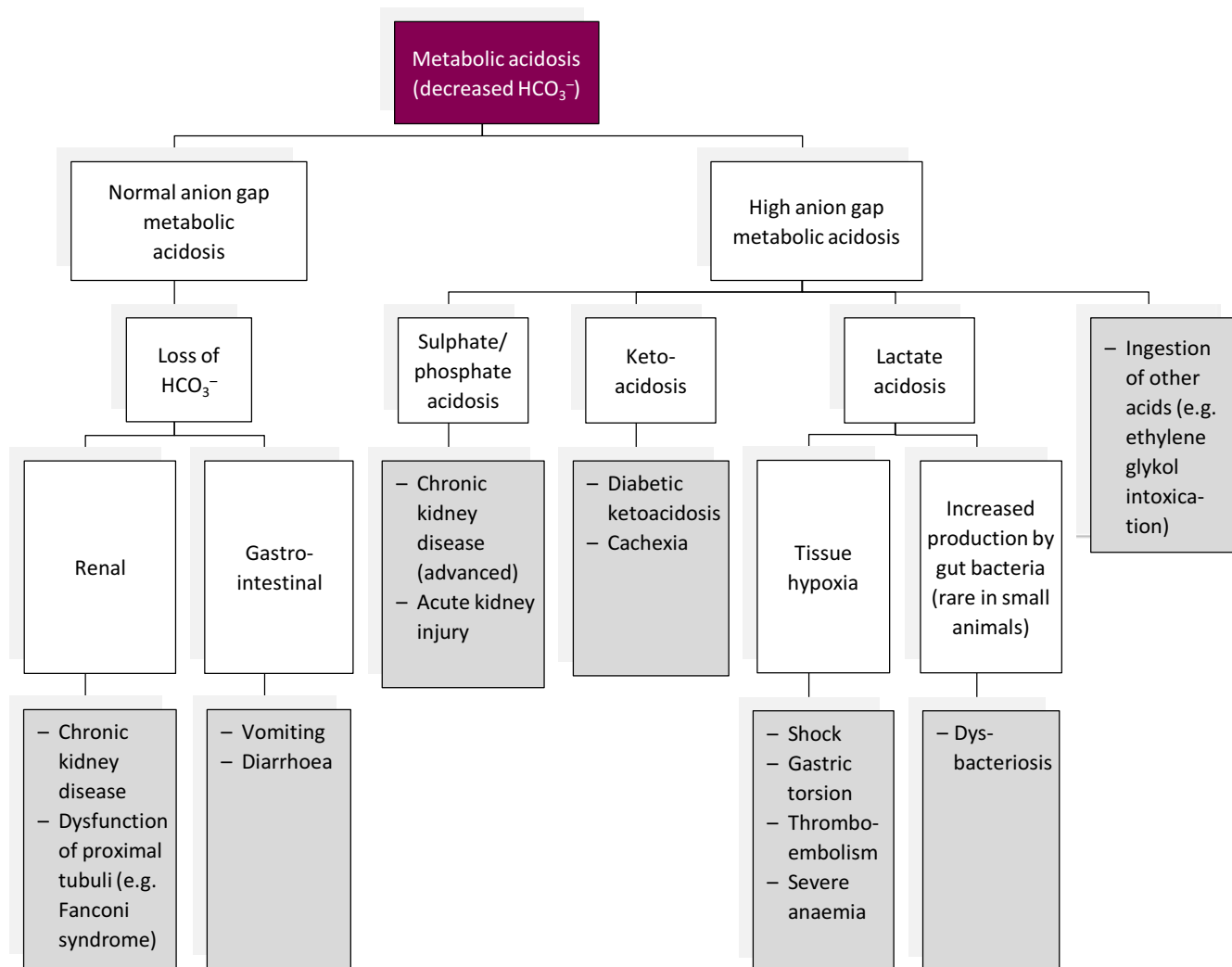


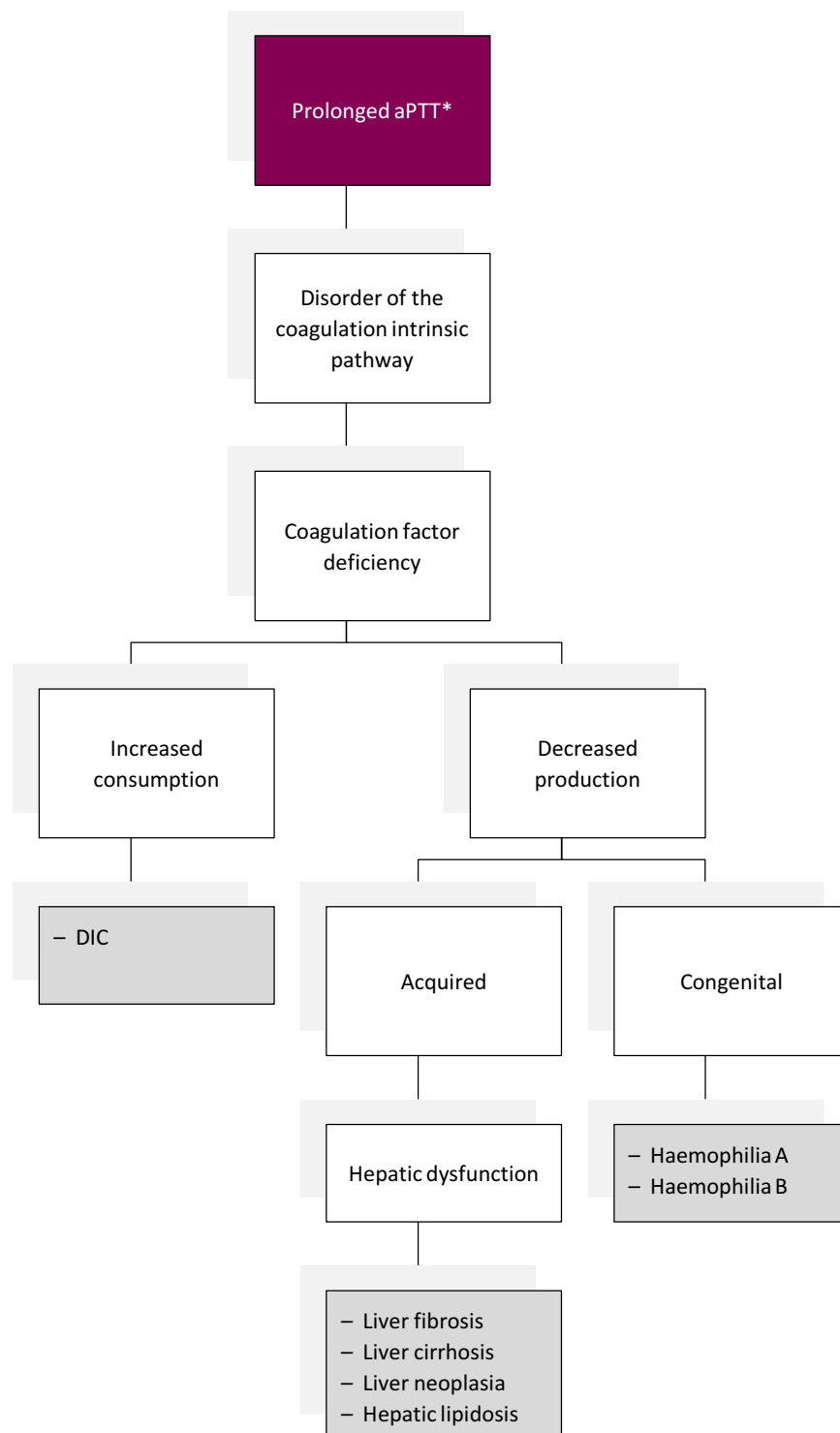




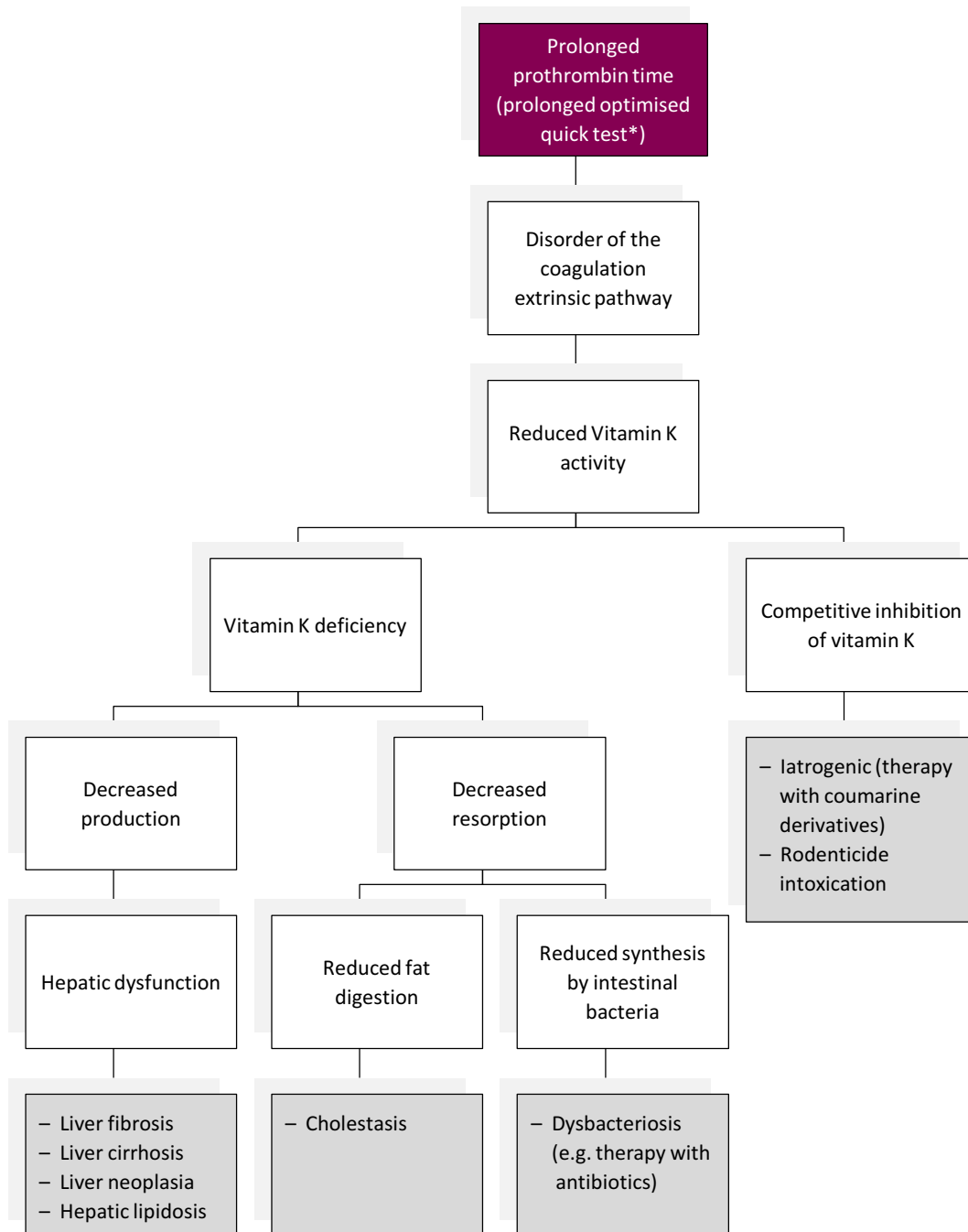




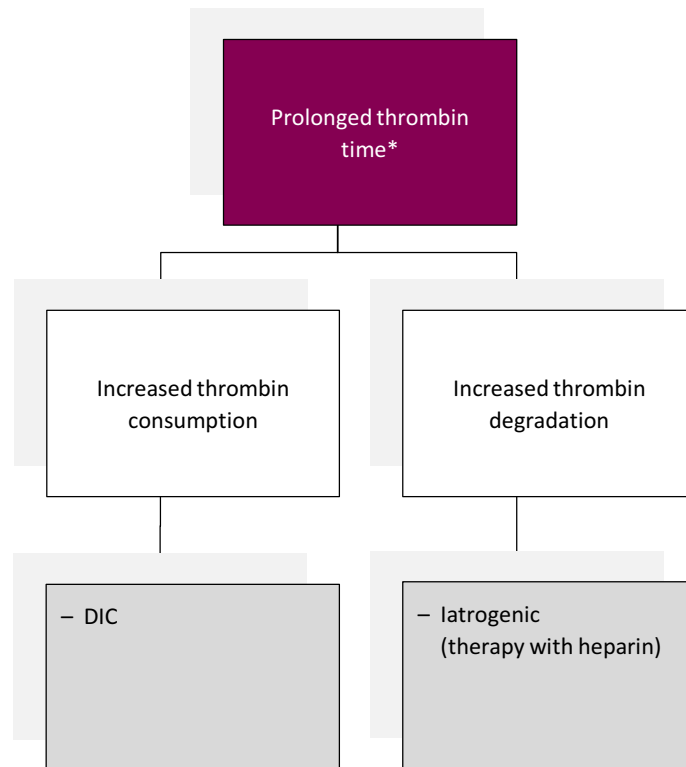




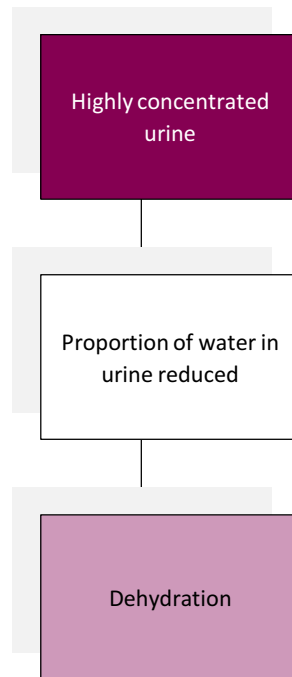
* Shortened aPTT is not clinically relevant

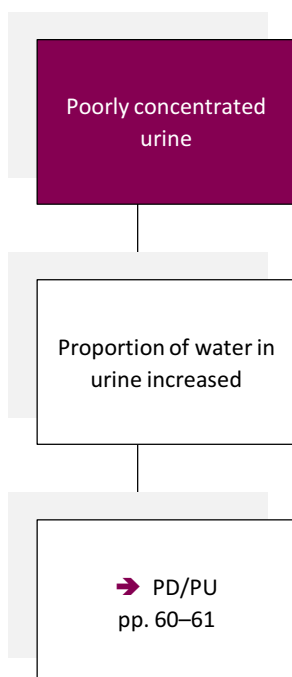


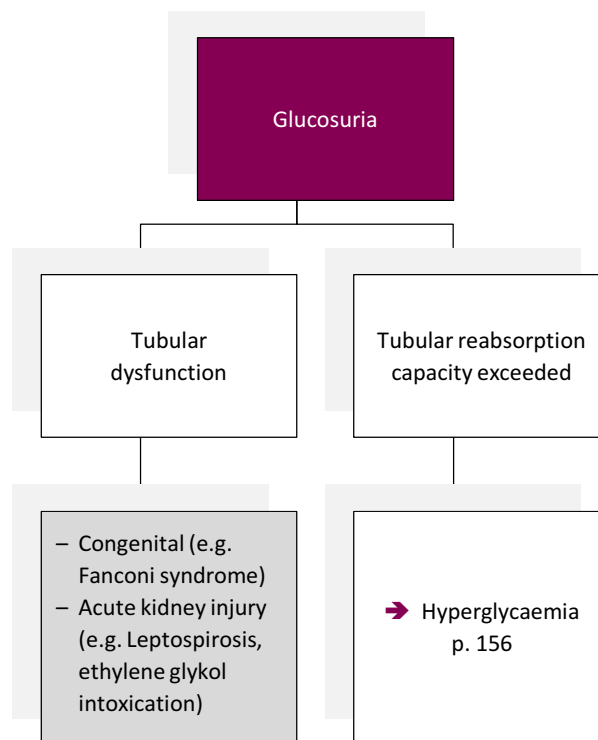
* Shortened prothrombin time is not clinically relevant

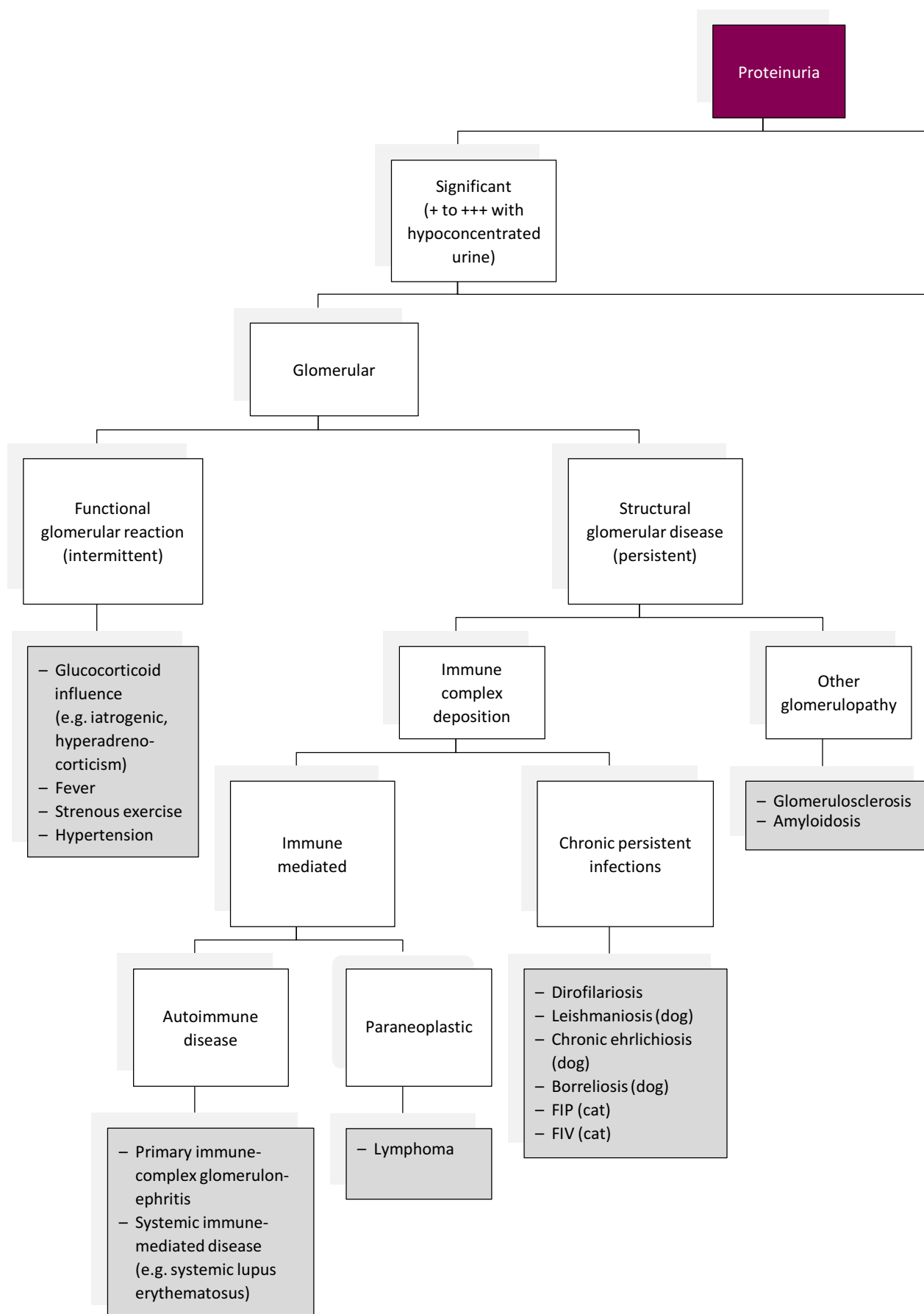


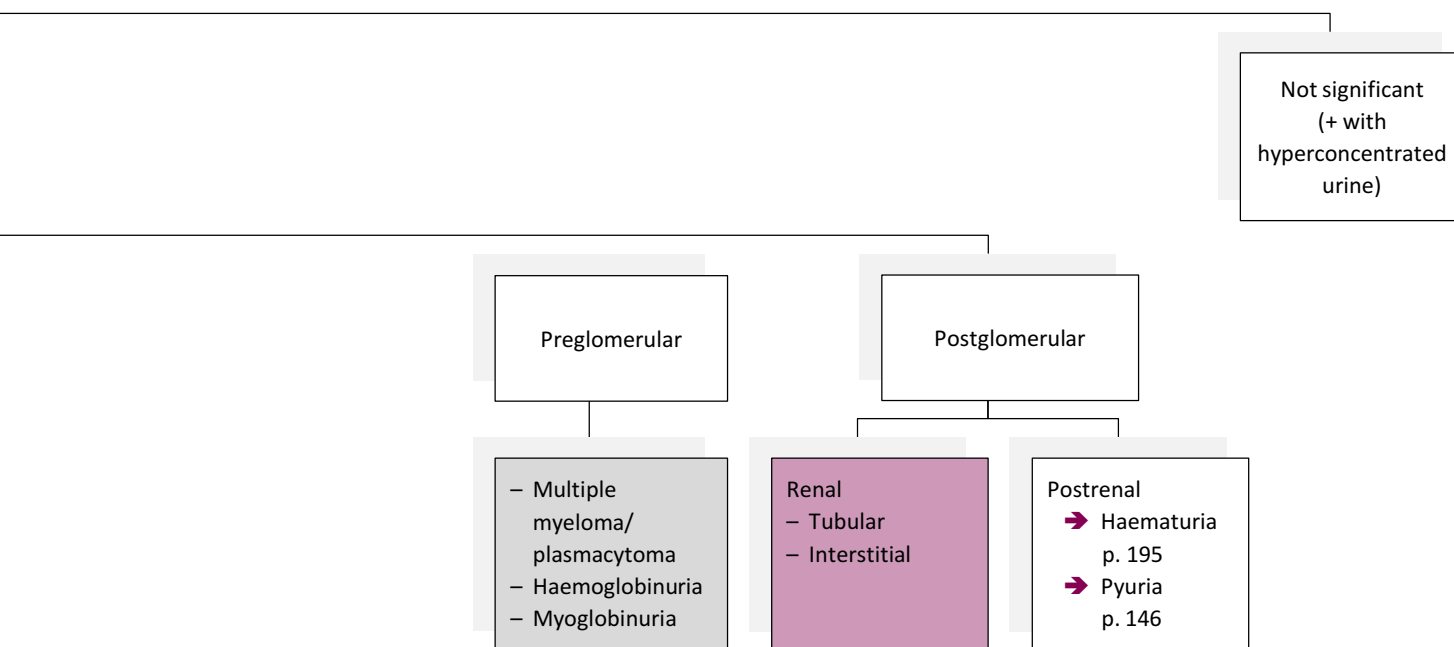
* Shortened thrombin time nicht is not clinically relevant

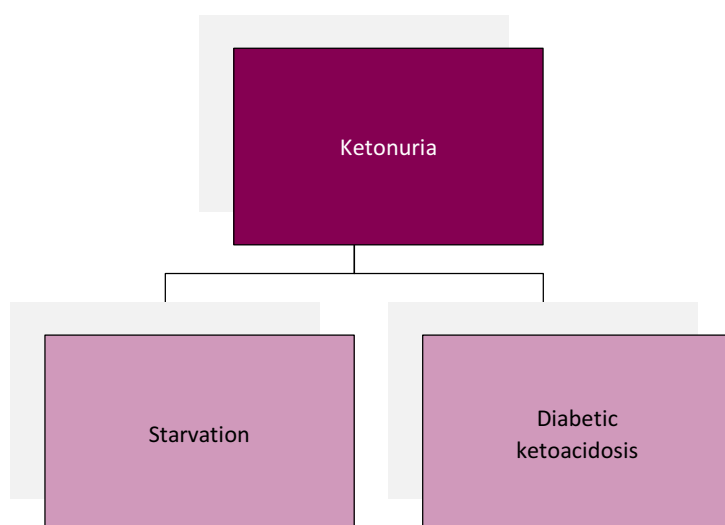


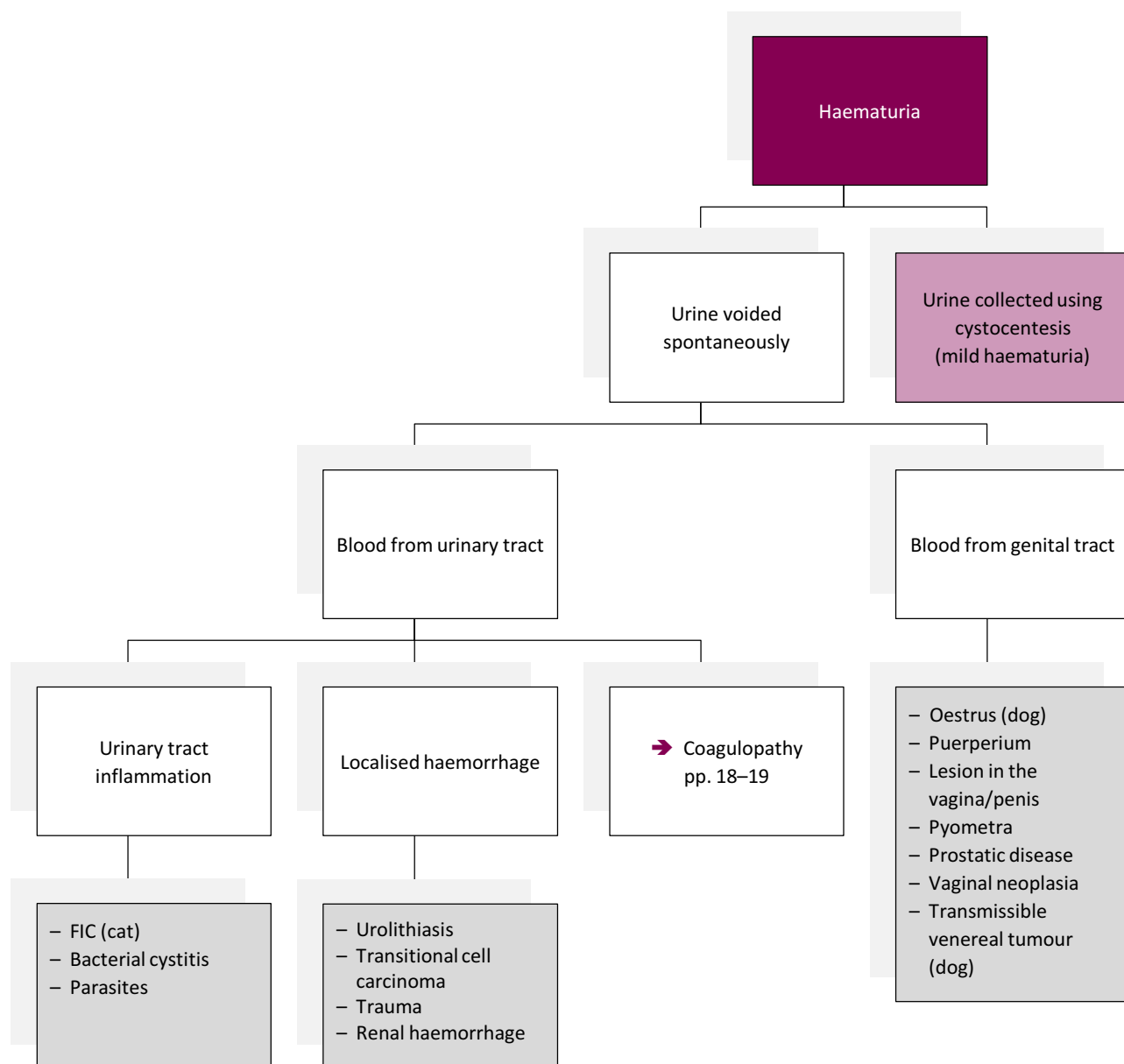


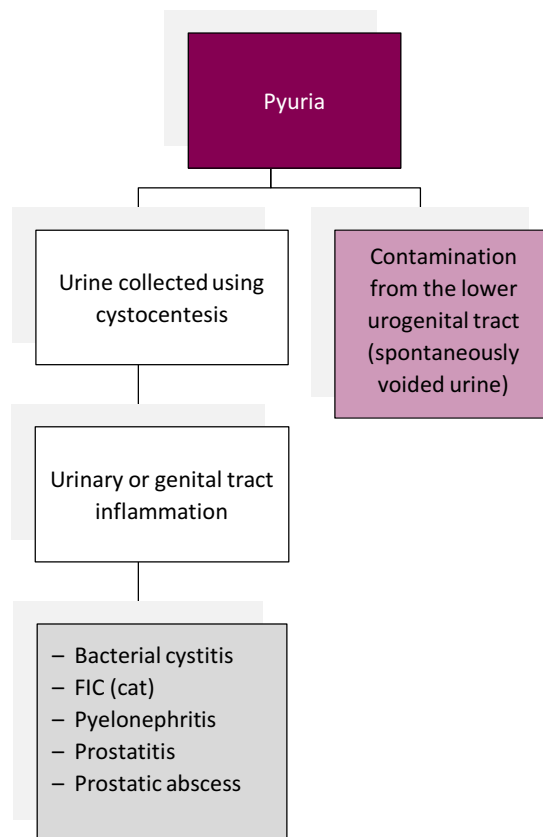


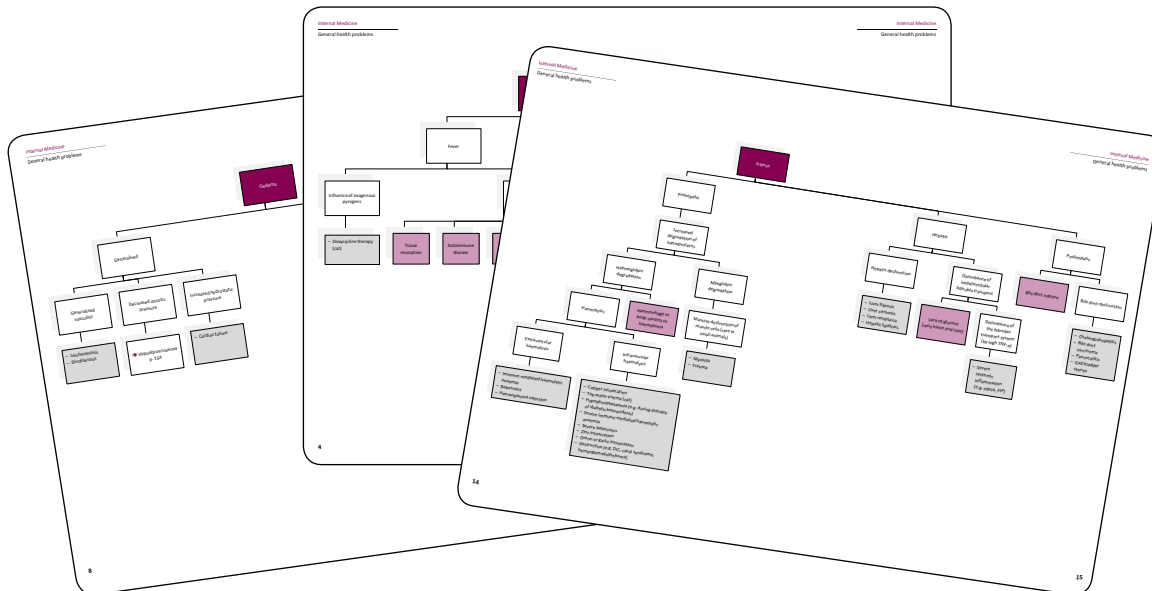












How to achieve a reliable diagnosis – even in complex clinical cases!

Internal medicine cases can be complex and challenging. To manage such challenges, it is helpful to know the possible pathophysiological causes of a particular clinical problem, to be able to evaluate each problem in an individual case and to exclude anything not relevant for this patient using diagnostic pathways. This book describes this process of exclusion (“ruling out”) for all aspects of internal medicine in dogs and cats, and ultimately leads to confirmation of a specific diagnosis. Rule outs therefore are an important basis for everyday clinical work and provide a practical guideline for a systematic problem-oriented approach to patients.

For students, these rule outs are a prerequisite for understanding the pathophysiology of clinical presentations and laboratory changes. For experienced clinicians, rule outs are a helpful diagnostic guide especially when dealing with complex cases.

ESSENTIAL

Expert knowledge for everyday clinical work

UNIQUE

The easy way to a correct diagnosis: comprehensive and concise

VET SCRIPTUM Helpful tool for studies and exams!

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