

ClinicalOS – Structured decision-making in general practice

Diagnostic Atlas (A)

Supplement to Volume 2: Rational Diagnosis



Manual 2 — Rational Diagnosis | Appendix: Speciality-Specific Diagnostics

About this sample

Diagnostic Atlas A - Supplement to Volume 2

This curated sample contains 12 pages from a 230-page volume. Atlas rule: 8%, limited to 6-12 pages including the notice and end page. It includes the extracts listed below. Original page numbers are retained; gaps are intentional. This overview and the PDF bookmarks cover the included sections. Printed cross-references may refer to the complete volume.

- **FG01 - Cardiology: introduction**
- **FG02 - Respiratory medicine: introduction**
- **FG02 - Respiratory medicine: laboratory parameters**

The original notices on use and responsibility also apply to this sample.

Copyright and Legal Notice

Dr Götz Huber, MD

Diagnostic Atlas (A) Supplement to Volume 2: Rational Diagnosis

© 2026 Dr Götz Huber, MD. All rights reserved.

This work, including all its parts, is protected by copyright. Any use beyond the strict limits of the Copyright Act is prohibited without the author's consent and is punishable by law.

Note: The information contained in this book has been carefully researched and verified. As AI tools and regulatory frameworks change rapidly, some details may already be out of date by the time you read this. You can find the latest updates at <https://clinicalos.de/>. Any mention of products and manufacturers is provided without guarantee and does not constitute a recommendation to purchase or use them.

Note on Translation, Content, Use and Liability

This English edition is a translation of the original work written in German. The concept, structure, and core medical content of ClinicalOS were originally developed for German general practice and the German healthcare system, to provide practising GPs, trainee GPs, healthcare assistants (HCAs) and medical students with a structured, practice-oriented learning and reference resource. The content is based on current medical literature, guideline-based sources and practical experience in general practice.

During the linguistic adaptation, references to guidelines, clinical practices and regulatory frameworks in other English-speaking settings were taken into account and highlighted where relevant and feasible; in some areas, differences from German recommendations are also presented explicitly. However, the translation does not constitute a systematic adaptation of every medical, therapeutic or regulatory aspect to all English-speaking countries. Professional guidelines, marketing authorisations, approved dosages, prescribing procedures, reimbursement rules and regulatory requirements may vary between countries;

the guidelines, official prescribing information and regulatory provisions currently applicable in the respective country or healthcare system always take precedence. Dosage information applies to adults without significant renal impairment; individual adjustments are required for elderly patients, those with polypharmacy and during pregnancy. **Current national/regional guidelines (e.g. NICE, ESC, ADA) must be followed as a priority.**

Digital tools, including AI-assisted text generation, were used in the creation of this manual. All content was subsequently checked by the author for technical accuracy, consistency and potential errors. **No guarantee can be given for the correctness, currency or completeness of the information provided;** the complete absence of errors cannot be excluded, including with regard to guidelines or dosage recommendations that may have been updated in the meantime.

The contents of this manual do not replace an individual medical assessment and should not be construed as binding treatment recommendations.

Diagnostic and therapeutic decisions must always be made on a case-by-case basis for each individual patient, taking into account the full clinical picture and the currently valid guidelines. **Doctors bear full and ultimate medical responsibility:** any use of content from this manual — whether as a text module, SOP or treatment recommendation — requires independent professional review by the treating doctor. **AI-supported or digitally generated content cannot and must not replace medical judgement.**

Any use of the information presented here is the sole responsibility of the reader. Liability claims relating to damage of a material or immaterial nature arising from the direct or indirect use of the information contained in this manual — even where such information is incomplete or contains errors — are generally excluded.

FG01 Cardiology — Diagnostic Atlas

Staged diagnostic approaches · Laboratory parameters with costs · STOP/START diagnostics · Emergency thresholds

Sources: ESC Guidelines | DEGAM S3 | ACC/AHA Guideline | ESC SCORE2 | Choosing Wisely Cardiology

Introduction to the Speciality

Clinical significance: Cardiovascular diseases are the leading cause of death in Germany — one in three deaths is due to cardiovascular causes. Early risk stratification and correct interpretation of biomarkers are crucial for survival and prognosis.

Diagnostic characteristics: Troponin dynamics take precedence over absolute values — the 0h/1h algorithm (ESC 2020) is the standard. ECG + hs-troponin + echocardiography form the diagnostic triad. Assessing a heart attack without ECG evaluation constitutes a clinical error.

Laboratory specifics: hs-troponin T/I without serial monitoring is diagnostically worthless. BNP/NT-proBNP indicates the burden of heart failure, not infarction. Elevated BNP + normal troponin = heart failure; conversely = ACS.

Link to the Atlas: KURZ forms the triage system based on key symptoms (chest pain, dyspnoea, syncope). EXT lists the biomarker ladder. STOPP/START protects against under-treatment in STEMI and over-treatment in cases of non-cardiac pain.

Epidemiology & Clinical Relevance

CHD: 6 million people affected in Germany, the most common single cause of death. Heart failure: 4 million people affected, 50% of diagnoses initially made by GPs. Atrial fibrillation: 1.8 million, 80% of diagnoses made in GP practices. Arterial hypertension: 20–30 million people affected; the main risk factor for CHD, stroke and heart failure.

Basic diagnostic principles in cardiology

1. Stepwise diagnosis: ECG and basic laboratory tests first. Troponin only if ACS is suspected. NT-proBNP only if heart failure is clinically suspected. Sequence takes precedence over scope.
2. Cost-benefit principle: Total cholesterol + HDL + LDL + triglycerides + glucose = approx. €14 under statutory health insurance (check-up). Lp(a) = one-off charge of €20 as an additional service. Troponin (private health insurance) ~€25.
3. Pre-analytical factors are crucial: potassium (no fluid retention!), triglycerides (fasting!), aldosterone/renin (medication break!), D-dimer (cold chain!).
4. Choosing Wisely: DO NOT perform routine CK testing whilst on statins. DO NOT test for troponin without clinical suspicion. DO NOT carry out lipid monitoring whilst on stable therapy.
5. Memorise emergency thresholds: Potassium <3.0 or >6.0 → immediately. Troponin + chest pain → immediately. NT-proBNP >5000 + dyspnoea → immediately.

Cost legend: € = <5 € (statutory health insurance standard benefit) | €€ = 5–30 € (statutory health insurance or IGeL depending on indication) | €€€ = >30 € (predominantly IGeL / private health insurance) Price source: MDI Limbach Berlin, Price List 2025 V01 (GOÄ, standard multiplier). Total panel costs: Basic health insurance risk panel ~€14 | Extended panel ~€70 | Full profile incl. Lp(a)/hsCRP ~€100

LESEPROBE

FG02 Respiratory Medicine — Diagnostic Atlas

Staged diagnostic procedures · Laboratory parameters with costs · STOP/START diagnostics · Emergency thresholds

Sources: GOLD 2024 (COPD) · GINA 2024 (Asthma) · S3 Guideline on CAP 2021 · DGP Guideline on Pulmonary Embolism 2023 · S3 Guideline on Pleural Effusion 2019

Introduction to the Speciality

Clinical significance: COPD is the fourth leading cause of death worldwide; asthma affects 300 million people. In Germany, 60% of COPD cases remain undiagnosed — because spirometry is not carried out.

Diagnostic characteristics: The inflammatory profile determines the treatment: eosinophilic versus neutrophilic inflammation means ICS response versus non-response. Spirometry is the ECG of respiratory medicine — and is just as frequently omitted.

Laboratory specifics: PCT distinguishes between bacterial and viral causes more accurately than CRP alone. D-dimer is only useful for ruling out pulmonary embolism when the pre-test probability is low. Eosinophils in the differential blood count guide the choice of COPD biologics.

Link to the Atlas: KURZ stratifies stages of dyspnoea from spirometry to chest CT. EXT shows the inflammation and allergy profile. STOPP prevents the reflexive use of antibiotics in cases of viral exacerbation.

Epidemiology & Clinical Relevance

COPD: ~5 million people affected in Germany (leading cause of death by 2030). Asthma: 8–10% of the population. CAP: 400,000–600,000 hospital admissions per year. Pulmonary embolism: ~35,000 deaths per year. Lung cancer: the most common cause of cancer-related death. >20% of all GP consultations concern respiratory symptoms.

Basic diagnostic principles

1. Stepwise diagnosis: Conduct a structured assessment of dyspnoea — acute (PE, pneumothorax?) vs. chronic (COPD, HI?). Spirometry is the gold standard for diagnosing obstruction.
2. Cost-benefit: Complete blood count + CRP + spirometry cover 80% of outpatient cases. Chest CT only in the presence of red flags, not as a screening tool.
3. Pre-analytical considerations: Arterial blood gas analysis (ABGA) should be performed using capillary blood (ear lobe) where possible — venous ABGA is only useful for pH and pCO₂, not for pO₂. D-dimer testing is only appropriate if the pre-test risk is low or moderate according to the Wells score.
4. Choosing Wisely: No routine chest X-ray for uncomplicated cough lasting <4 weeks without red flags. No PCT unless relevant to the decision on antibiotics.
5. Emergency thresholds: SpO₂ <90% → immediate oxygen + emergency doctor. Wells score ≥5 + positive D-dimer → immediate imaging. PEF decline >50% → status asthmaticus.

Cost legend: € = <5 € | €€ = 5–30 € | €€€ = >30 € Price source: MDI Limbach Berlin 2025 (GOÄ, standard multiplier 1.0)

Part 3 — Laboratory Parameters Atlas

12 parameters | Reference range, sensitivity/specificity, costs (GOÄ), GKV status, pitfalls

Parameter	Stage	Material	Reference range	Sens/Spec	Costs under the GOÄ	GKV?	Pitfall / Caution	Clinical note
CRP (C-reactive protein)	1	Serum	<5 mg/l (normal) hs-CRP <1.0 mg/l	CAP Sens 75% / Spec 67%	€2.68	Statutory health insurance: Yes	Caution: CRP levels may also be elevated in viral infections. CRP >100 mg/l → bacterial cause likely.	CRP for monitoring progress. PCT is superior for deciding on antibiotics in CAP.
Complete blood count + differential	1	EDTA	White blood cells: 4–10 G/l Eosinophils <0.5 G/l	Leukocytes >12 for bacterial CAP: sensitivity 60%	€5.37	Statutory health insurance: Yes	Caution: Normal white blood cell counts do not rule out severe pneumonia (immunosuppression!).	Eosinophils >0.3 G/l → asthma biomarker; supports ICS therapy even in COPD.
Capillary arterialised blood gas analysis	1	Capillary blood from the earlobe (pre-warmed)	pO ₂ : 71–100 mmHg pCO ₂ : 35–45 mmHg pH: 7.35–7.45	Respiratory failure: Sensitivity/Specificity 100%	€5.37	Statutory health insurance: Yes	Caution: Venous blood gas analysis does NOT show pO ₂ ! Only capillary/arterial blood gas analysis is used to assess oxygenation.	LTOT indication: pO ₂ <55 mmHg (or <60 in cases of polycythaemia/cor pulmonale). 16–18 hours per day.
Procalcitonin (PCT)	1	Serum	<0.10 µg/l Grey area: 0.10–0.25 µg/l	Bacterial CAP: Sensitivity 80% / Specificity 74%	€12.06	Statutory health insurance: Subject to conditions	Caution: PCT ONLY if the decision to prescribe antibiotics depends on it. Not as a routine substitute for CRP.	PCT protocol: Start antibiotics at ≥0.25 µg/l. Stop antibiotics when the level falls below 0.25. Reduces the number of days on antibiotics.

Parameter	Stage	Material	Reference range	Sens/Spec	Costs under the GOÄ	GKV?	Pitfall / Caution	Clinical note
D-dimer	2	Citrate plasma	<0.50 mg/l FEU (age-adjusted: age × 0.01 from age 50)	Exclusion of PE (low WS): Sensitivity 95% / Specificity 40%	€12.06	Statutory health insurance: Yes	Caution: Only for LOW pre-test risk score (Wells <2)! If risk score is high → immediate CT pulmonary angiography, no D-dimer.	Age-adjusted: 70 years → cut-off value 0.70 mg/l. Significantly fewer false-positive results.
NT-proBNP	2	Serum/EDTA plasma	<125 pg/ml (<75 years) <450 pg/ml (>75 years)	Heart failure with dyspnoea: Sensitivity 90% / Specificity 84%	€32.18	Statutory health insurance: Subject to conditions	Caution: Elevated in renal insufficiency (GFR-dependent clearance). Assess renal function as well.	Differential diagnosis of dyspnoea: NT-proBNP normal → cardiac cause unlikely → investigate pulmonary causes.
Alpha-1-antitrypsin (α1-AT)	2	Serum	>0.9 g/l (normal) Deficiency: <0.5 g/l (PiZZ)	Cause of COPD in PiZZ: Sensitivity 100%	€12.06	Statutory health insurance: Subject to conditions	Caution: Acute-phase protein — falsely elevated in cases of inflammation. Genotyping if suspected.	Test ONCE ONLY: COPD in patients under 45, non-smokers with COPD, familial clustering. Then never again.

Parameter	Stage	Material	Reference range	Sens/Spec	Costs under the GOÄ	GKV?	Pitfall / Caution	Clinical note
Total IgE	2	Serum	<100 kU/l (adults) >200 kU/l: atopic predisposition	Atopic asthma: indicative / specificity 85%	€16.76	Statutory health insurance: subject to conditions	Caution: Also elevated in cases of parasitic infections, ABPA and atopic dermatitis. Total IgE alone is not diagnostic.	Basis for anti-IgE (omalizumab): IgE 30–1500 kU/l required. Document the value before starting biologics.
Legionella antigen (urine)	2	Urine (midstream sample)	Negative	Legionella CAP: Sensitivity 70–80% / Specificity >99%	€16.76	Statutory health insurance: Yes (in cases of suspected infection)	Caution: Detects only serogroup 1 (~80%). Always test for severe CAP. Positive results must be reported.	Treatment: Levofloxacin or clarithromycin — NO beta-lactams for Legionella.
IGRA (Quantiferon-TB-Gold)	2	Special heparin tubes	Negative (<0.35 IU/ml)	Latent TB: Sensitivity 80% / Specificity 99%	€28.55	Statutory health insurance: Yes (suspected TB)	Caution: False-negative results may occur in cases of immunosuppression (HIV, steroids, anti-TNF). BCG vaccination has no effect.	IGRA before ANY biologic/TNF inhibitor therapy! Positive IGRA → 9 months' isoniazid prophylaxis.

Parameter	Stage	Material	Reference range	Sens/Spec	Costs under the GOÄ	GKV?	Pitfall / Caution	Clinical note
CYFRA 21-1 (cytokeratin-19)	3	Serum	<3.3 µg/l	NSCLC: Sensitivity 55% / Specificity 95%	€30.16	Statutory health insurance: Subject to conditions	Caution: False-positive results may occur in cases of renal insufficiency and benign lung diseases. Not a screening test.	Best sensitivity for squamous cell carcinoma. More useful for monitoring progression after the start of treatment.
NSE (neuron-specific enolase)	3	Serum (haemolysis-free!)	<16.3 µg/l	SCLC (small cell): Sensitivity 60% / Specificity 90%	€30.16	Statutory health insurance: Subject to conditions	Caution: Haemolysis → massive increase! Centrifuge the sample IMMEDIATELY. Also elevated in neuroendocrine tumours.	Monitoring SCLC during chemotherapy: sharp decline = good response. Never use for screening.

Explore the complete ClinicalOS edition

Diagnostic Atlas A - Supplement to Volume 2

For information about the complete edition and the ClinicalOS series, visit:

clinicalos.de

The original notices on use and responsibility also apply to this sample.