Medical Reference Cards

github.com/alping/medical-reference-cards

Adrenal Venous Sampling

Introduction: Primary aldosteronism (PA) is more common than previously thought. Up to 15% of all hypertension is due to PA. PA can be caused by bilateral or unilateral hyperplasia, an adenoma, or by mutations in genes coding for enzymes involved in aldosterone (AS) synthesis. **Adrenal venous sampling (AVS)** is a procedure used to diagnose the **source** of the excess aldosterone (i.e. whether it is uni- or bilateral). Why is this important? Because unilateral PA is treated surgically, whereas bilateral PA is managed medically. AVS is, by far, the most reliable way of establishing the source of excess AS.

The procedure: With AVS, the difference between left and right adrenal AS excretion is measured by sampling blood from each **adrenal vein (AV)**. This is more complicated than it sounds, mostly for anatomical reasons. The **right adrenal vein** is very short and originates directly from the **inferior vena cava (IVC)**, making it very difficult to cannulate. The **left AV** originates from a common trunk with the inferior phrenic vein (IPV), which, in turn, originates from the left renal vein. The common trunk is easier to cannulate than the left AV itself, but dilution from the IPV must then be compensated for when interpreting the AS level (in the common trunk, left AV blood is mixed with IPV blood, which obviously has a lower AS concentration).

Adrenal Venous Sampling

Execution: The **right AV**, **IVC**, and **left AV** are cannulated, and blood is sampled for analysis of **AS** and **cortisol** levels. The AVs are catheterized through the percutaneous femoral vein approach. Gentle contrast injections are used to verify the position of the catheter tip.

- Why is blood sampled from the IVC? Why is the cortisol level analyzed? Aren't we only interested in the AS levels? These questions are answered in the interpretation section.

Interpretation: Ultimately, we're interested in whether there's a significant difference between AS levels in the two adrenal veins. So why cannulate the IVC? Because comparing the right AV and IVC cortisol levels tells us whether or not the difficult cannulation was successful – the cortisol level should be **≥3 higher** in the right AV. If this is the case, we can trust subsequent measurements.

Before AS levels are compared, we must account for dilution. This is done by dividing the AS level with the cortisol level in each AV – the ratio will be the same regardless of dilution. These **corrected** values (A/C ratios) are the ones used in the final comparison.

If the A/C ratio of one adrenal vein is ≥4 times higher than that of the other, the source of AS is unilateral and should be treated **surgically**.

- General -

C-ABCDE

C Catastrophic bleeding / Cardiac arrest

A Airways

Check airway
Thorax movement
See, listen, feel
Paradox. breathing?
Stridor?

1. Chin lift/Jaw thrust
2. Naso/Oropharyngeal airway
3. Suction
4. Laryngeal mask airway
5. Intubation
6. Coniotomy

B Breathing

Respiratory rate
Thorax movement
Auscultation
Cyanosis

1. Oxygen
2. Ventilation
3. Decompression
4. Chest tube

C Circulation

Colour (Pale)
Cold/Sweaty
Pulse (Rad / Fem / Car)
Abdomen/Pelvis

1. Tilt bed
2. Fluids (PVC, IO, CVC)
3. Vasoactive drugs (Adrenalin IM)

D Disability

AVPU/GCS
Pupils
Movement of extrem.

1. Support ABC
2. Glucose
3. Antidote

E Exposure

Check whole body
Prevent hypothermia
Prevent further injury

1. Log roll
2. Warm blankets
3. Warm fluids

- General -

SBAR

S Situation

Own name, title, and unit
Patients name, sex, and age
Patients social security / identification number
Describe situation briefly
I'm contacting you to...

B Background

Previous and current illness
Relevant medical history
Allergies
Contagiousness

A Assessment

A: Airway
B: Breathing, saturation
C: Heart rate, blood pressure
D: Consciousness, pain, oriented to time / place / person
E: Temperature, skin, colour, abdomen, urine production
Brief assessment

R Recommendation

Immediate action (Care, monitoring, transfer, treatment)
Further examinations (Radiology)
Time frame (How often...? How long...? Next contact...?)

Confirmation of communication
Questions / Agreement

- Laboratory -

Lab reference (Swe)

Sys.	Component	Subgroup	Ref. interval	Unit
P/S	**ALAT**	Male	0,15 – 1,1	µkat/L
		Female	0,15 – 0,75	µkat/L
P/S	**ALP**		0,60 – 1,8	µkat/L
P/S	**Amylas**		0,40 – 2,0	µkat/L
P/S	**Albumin**	18 – 40 y.	36 – 48	g/L
		41 – 70 y.	36 – 45	g/L
		>70 y.	34 – 45	g/L
P/S	**ASAT**	Male	0,25 – 0,75	µkat/L
		Female	0,25 – 0,60	µkat/L
P/S	**Bilirubin**		5 – 25	µmol/L
P/S	**Calcium**		2,15 – 2,50	mmol/L
P/S	**CK**	Male 18 – 50 y.	0,80 – 6,7	µkat/L
		Male >50 y.	0,70 – 4,7	µkat/L
		Female	0,60 – 3,5	µkat/L
P/S	**Fosfat**	Female	0,80 – 1,5	mmol/L
		Male 18 – 50 y.	0,70 – 1,6	mmol/L
		Male >50 y.	0,75 – 1,4	mmol/L
fP	**Glukos**		4,2 – 6,3	mmol/L
P/S	**GT**	Male 18 – 40 y.	0,15 – 1,3	µkat/L
		Male >40 y.	0,20 – 1,9	µkat/L
		Female 18 – 40 y.	0,15 – 0,75	µkat/L
		Female >40 y.	0,15 – 1,2	µkat/L
P/S	**Järn**		9 – 34	µmol/L
P/S	**Järnmättnad**	Male	0,15 – 0,60	
		Female 18 – 50 y.	0,10 – 0,50	
		Female >50 y.	0,15 – 0,50	
P	**Kalium**		3,5 – 4,4	mmol/L
S	**Kalium**		3,6 – 4,6	mmol/L
P/S	**Kolesterol**	18 – 30 y.	2,9 – 6,1	mmol/L
		31 – 50 y.	3,3 – 6,9	mmol/L
		>50 y.	3,9 – 7,8	mmol/L
P/S	**HDL-Kolesterol**	Female	1,0 – 2,7	mmol/L
		Male	0,80 – 2,1	mmol/L

- Laboratory -

Lab reference (Swe)

Sys.	Component	Subgroup	Ref. interval	Unit
P/S	**LDL-Kolesterol**	18 – 30 y.	1,2 – 4,3	mmol/L
		31 – 50 y.	1,4 – 4,7	mmol/L
		>50 y.	2,0 – 5,3	mmol/L
P/S	**Kreatinin**	Male	60 – 105	µmol/L
		Female	45 – 90	µmol/L
P/S	**LD**	18 – 70 y.	1,8 – 3,4	µkat/L
		>70 y.	1,9 – 4,2	µkat/L
P/S	**Magnesium**		0,70 – 0,95	mmol/L
P/S	**Natrium**		137 – 145	mmol/L
P/S	**Pankreasamylas**		0,15 – 1,10	µkat/L
P/S	**Protein**		64 – 79	g/L
P/S	**TIBC**		47 – 80	µmol/L
P/S	**Triglycerider**		0,45 – 2,6	mmol/L
P/S	**Urat**	Male	230 – 480	µmol/L
		Female 18 – 50 y.	155 – 350	µmol/L
		Female >50 y.	155 – 400	µmol/L
P/S	**Urea**	Male 18 – 50 y.	3,2 – 8,1	mmol/L
		Male >50 y.	3,5 – 8,2	mmol/L
		Female 18 – 50 y.	2,6 – 6,4	mmol/L
		Female >50 y.	3,1 – 7,9	mmol/L
B	**Hemoglobin**	Female	117 – 153	g/L
		Male	134 – 170	g/L
B	**EVF**	Female	0,350 – 0,458	
		Male	0,393 – 0,501	
B	**Erytrocyter**	Female	3,94 – 5,16	1012/L
		Male	4,25 – 5,71	1012/L
B	**MCV**		82 – 98	fL
Erc	**MCH**		27,1 – 33,3	pg
Erc	**MCHC**		317 – 357	g/L
B	**Leukocyter**		3,5 – 8,8	109/L
B	**Trombocyter**	Female	165 – 387	109/L
		Male	145 – 348	109/L

- Medicine -

CHA2DS2VAS

C	Cardiac - Heart failure	**1**
H	Hypertension	**1**
A	Age ≥ 75 years	**2**
D	Diabetes	**1**
S	Stroke/TIA/embolism	**2**
V	Vascular Atherosclerotic disease	**1**
A	Age 65-74	**1**
S	Sex - Female*	**1**

*No indication for antithrombotic treatment if only risk factor

AF and score ≥2 → Antithrombotic treatment
***IF* low-medium risk of bleeding (HAS-BLED <3)**

See local guidelines for specific antithrombotic drugs

Example of initial Warfarin treatment, 2.5mgx1 p.o.

Day 1: 2-4 | Day 2: 2-3 | Day 3: 1-4 (dep. on INR)

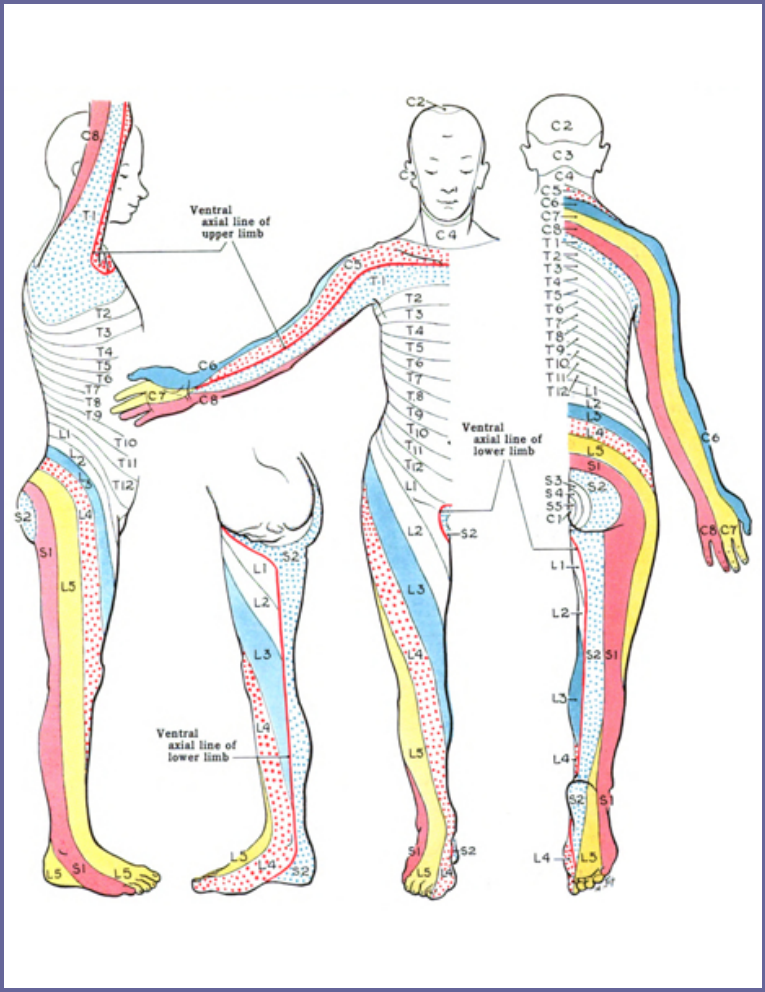
HAS-BLED

H	Hypertension >160 mmHg	**1**
A	Abnormal liver or kidney function*	**1-2**
S	Stroke	**1**
B	Bleeding Previous tendency or anaemia	**1**
L	Labile INR High/unstable INR or <60% time in therapeutic range	**1**
E	Elderly (>65 years)	**1**
D	Drugs E.g. ASA, NSAID or high alcohol consumption	**1-2**

* Kidney: Creatinine >200, dialysis, or transplant
Liver: Chronic liver disease, Bilirubin 2x ref, or ALAT/ASAT/ALP 3x ref.

High risk of bleeding if ≥3 points

Dermatomes


Ventral axial line of upper limb
Ventral axial line of lower limb
Ventral axial line of lower limb
C2
C3
C4
C5
C6
C7
C8
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
L1
L2
L3
L4
L5
S1
S2
S3
S4
S5

Myotomes

Segment	Function
C1/C2	Neck flexion/extension
C3	Neck lateral flexion
C4	Shoulder elevation
C5	Shoulder abduction
C6	Elbow flexion/wrist extension
C7	Elbow extension/wrist flexion
C8	Finger flexion
T1	Finger abduction
L2	Hip flexion
L3	Knee extension
L4	Ankle dorsi-flexion
L5	Great toe extension
S1	Ankle plantar-flexion/ankle eversion/ hip extension
S2	Knee flexion
S3–S4	Anal wink

Neurological exam.

The whole time
Psychiatric: Wakefulness, oriented to time/place/self
Motor: Facial expressions, general
Dysarthria, dysphasia, right or left handed
Higher cortical functions: Apraxia, spatial function, neglect

Standing
Walk across the room
Walk on toes/heels
Squat and rise
Sight and hearing

Sitting
Face: Symmetry, ptos, corneal reflex
Pupils: Size, reaction to light
Eye movements: Nystagmus, diplopia
Sight: Donder's test
Mouth and throat: Symmetry, swallow reflex, gingival hyperplasia, cranial nerve XII
Sensibility to light touch, vibration, temperature, and pain
Motoric function for cranial nerve V, VII, XI
Reflexes in arms and legs
Grasset's test
Auskultation of lungs
Palpate lymph nodes
(Smell and taste)

Lying down
Neck stiffness
Muscle strength: proximal + distal, in arms and legs
Muscle tonus, atrophies, fasciculation, tremor,
Heel-knee test
Dysdiadochokinesis
Abdominal reflexes
Barré’s test
Babinski's sign
Fundus examination
(Primitive reflexes: Grasping reflex, palmomental, glabellar, sucking)

Glasgow Coma Scale

	Respone	Score
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score	Best response	15
	Comatose patient	≤8
	Totally unresponsive	3

Ottawa Ancle Rule

1 Pain around the malleolus AND

Palpation tenderness over the dorsal ridge of the lateral or medial malleus

OR

Inability of the foot to support four steps

2 Pain around the mid part of the foot AND

Palpation tenderness over the base of the 5th metatarsal bone OR the Navicular bone

OR

Inability of the foot to support four steps

X-ray of foot and lower leg if 1 or 2 are met

Otherwise: Elastic wrap, tape, possibly orthosis, information (proprioceptive exercises e.g. stand on one leg while brushing teeth)

Acute care (PRICE)
Protection, Rest, Ice, Compression, Elevation

Only applicable on adults (>18 years) with isolated injury

Well's DVT Score

Sign	Point
Active cancer last 6 months	**1p**
Paralysis, paresis, newly casted	**1p**
Immobilized >3 d. or large surgery last 4 w.	**1p**
Localized tenderness along the deep venous system	**1p**
Whole leg swelling	**1p**
Calf circumference >3 cm, compared to asymptomatic side	**1p**
Pitting oedema on symptomatic side	**1p**
Collateral flow in superficial veins (non-varicose)	**1p**
Similar likelihood of alternative diagnosis	**-2p**

Low points <2 + negative D-dimer
= low probability for DVT

High points ≥2 → Ultrasound whole leg

Risk of false negative D-dimer when symptoms >1w or anticoagulation therapy

Distal Status - Hand

Inspection

Hematomas / Wounds

Malalignment / Tonus

Palpation

Fossa tabatière

Distal radioulnar joint

Circulation

Allen's test – Ulnar / Radial loss of circulation

Capillary refill Dig I-V

Passive movement (tendons)

Finger extension, each separately

Flexor digitorum superficilais et profundus, separately

Neurology *1. Radialis 2. Medianus 3. Ulnaris*

Sensory		Motor
1. Dig I, radially 2. Dig II, distal of PIP 3. Dig V, ulnar side		1. Extension of fingers 2. Opposition, Dig I & V 3. F.spread / Dig V flex.

Stability

Dig I, MCP, UCL, Distal radioulnar joint

Watson's test – Instability, scaphiodeum - lunatum

Specific tests

Tinel's and Phalen's tests: carpal tunnel syndrome

Finkelstein's test: Morbus de Quervain

Pain in wrist should result in plain film x-ray

- Empty -

- Pediatrics -

Normal Physiology

Age	RR (/min)	HR (/min)	SBP (mmHg)
0-1 m	30-60	110-160	65-90
1-12 m	30-40	110-160	70-90
1-2 y	25-35	100-150	85-35
2-5 y	25-30	95-140	80-110
5-12 y	20-25	80-120	90-110
>12 y	15-20	60-100	100-120

Age	♀ W. (kg)	♀ H. (cm)	♂ W. (kg)	♂ H. (cm)
0 m	2.8-4.2	46-54	2.9-4.4	47-55
3 m	4.6-7.0	56-64	4.8-7.5	57-66
6 m	6.0-9.3	62-71	6.4-10	63-73
1 y	8.0-12	70-80	8.5-13	71-82
5 y	15-25	102-120	15.5-25	110-112
18 y	46-80	156-180	55-94	167-194

Age (m)	1-2	2-4	4-6	6-8	8-10	10-12
W. gain (g/w)	175	150	125	100	75	50

	W. (kg)	Fluids (ml/kg/24h)
	2-8	150
	6-10	115-120
Holliday-Segar	**0-10**	100
Holliday-Segar	**10-20**	50
Holliday-Segar	**>20**	20

A. (y)	ml/kg/hour
0-1	2-4
>1	1-2
▲ Urine / Oliguri ▼	
0-1	<1
>1	<0.5

Normal Physiology

Months	Gross motor	Fine motor	Cogn. & Comm.
1-2	Lift head when prone	-	Smile in resp. to face/voice, visual preference for human face
2-3	Head steady in sitting	-	-
3-4	Lift head & chest w. ext. arms	Grasp rattle	Sustain contact, displeasure if soc. contact broken, “aah, ngah”
5-6	Roll over	Transfer objects hand to hand	Monosyllabic babble
6-7	Sit with support	-	Polysyllabic babble, vowel sounds, enjoys mirrors
7-8	Sit without support, crawl	Thumb-finger grasp	Suspicious/afraid of strangers
9-10	Pull to standing pos., walk holding furniture	Pincer grip, bang objects together.	Play peek-a-boo, wave bye-bye, respond to own name
12-18	Walk alone	Turn pages in book, scribble, build 2-cube tower	Speak a few words
4 yrs.	Walk on a straight line, jump on one leg	Button clothes	Answer questions, understand prepositions