

ECG Leads

The 12 Conventional ECG Leads



Electrode



AVL

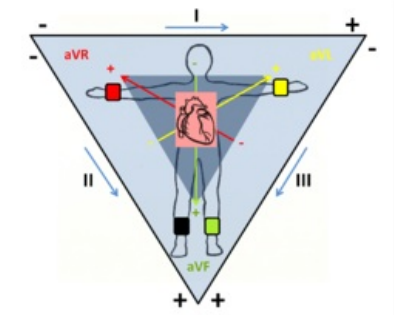
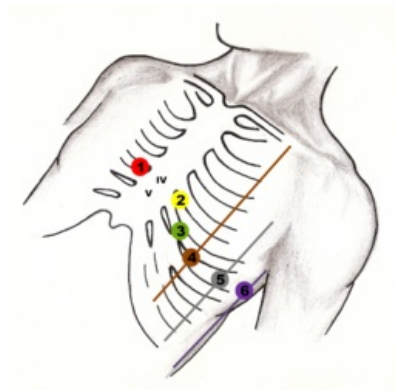


AVF

These 12 leads are divided into two groups:

- six extremity (limb) leads; they are recording electrical potentials transmitted into the frontal plane;
- six chest (precordial) leads, they are recording electrical potential transmitted into horizontal plane.^[1]

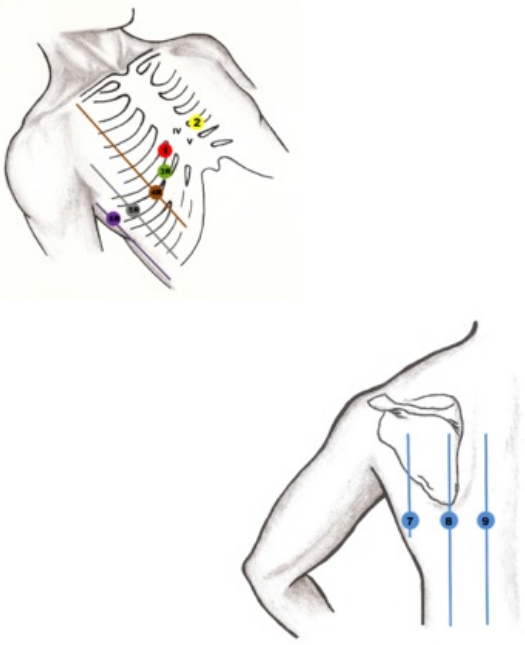
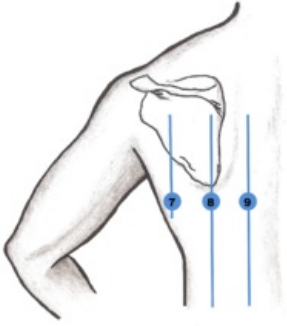
There are the leads with their location and polarity^[2]:

	limb	location of the lead				
bipolar extremity leads -Einthoven's leads-	I	+	left upper limb	-	right upper limb	
	II		left lower limb		right upper limb	
	III		left lower limb		left upper limb	
unipolar extremity leads -Goldberg's leads-	aVR	right upper limb lead				
	aVL	left upper limb lead				
	aVF	left lower limb lead				
unipolar chest leads -Wilson's leads-	V ₁	fourth intercostal space, just to the right of the sternum				
	V ₂	fourth intercostal space, just to the left of the sternum				
	V ₃	midway between V ₂ and V ₄ , fifth intercostal space				
	V ₄	fifth intercostal space, midclavicular line on the left				
	V ₅	fifth intercostal space, anterior axillary line				
	V ₆	fifth intercostal space, midaxillary line				

Additional ECG Leads

These leads are used in special situations, when conventional 12-leads ECG cannot reliably show the myocardial defect.^[1]

Below are some examples of additional ECG leads^[2]:

	lead	location of the lead	
unipolar chest leads	V ₇	posterior axillary line, on the same level as V ₆ , on the left	
	V ₈	scapular line, in the same level as V ₆ , on the left	
	V ₉	paravertebral line on the left, on the same level as V ₆	
	VE	just to the left of <i>processus xiphoideus</i>	
	V3R - V6R	on the right, same location as V ₃ -V ₆	
unipolar chest leads	V ₁ ' - V ₆ '	about 1 intercostal space above the V ₁ -V ₆	
	V ₁ '' - V ₆ ''	about 2 intercostal space above the V ₁ -V ₆	
esophageal leads	E/Oe	for example 37.5 cm (left atrium)	

Links

Related articles

- Electrocardiography
- Electrocardiogram

References

1. KASPER, Dennis L – FAUCI, Anthony S – LONGO, Dan L, et al. *Harrison's principles of Internal Medicine*. 16th edition. New York : McGraw-Hill Companies, Inc, 2005. 2607 pp. pp. 1312-1313. ISBN 0-07-139140-1.
2. WikiSkripta. *Elektrokardiografie* [online]. ©2011. The last revision 2011-07-2, [cit. 2011-07-03]. <<http://www.wikiskripta.eu/index.php/Elektrokardiografie>>.

Bibliography

- KASPER, Dennis L – FAUCI, Anthony S – LONGO, Dan L, et al. *Harrison's principles of Internal Medicine*. 16th edition. New York : McGraw-Hill Companies, Inc, 2005. 2607 pp. pp. 1311-1319. ISBN 0-07-139140-1.