Protocol
Electrocardiography (ECG)

Method

Equipment:

Set of standard limb electrodes, 6 chest single-use electrodes with connectors to cables or electrodes with fastening belt, connecting cables, PC, ECG gel, cotton-wool, examination bed, ECG ruler.

Procedure:

Clean the skin of the examined subject with alcohol and spread ECG contact gel on the electrodes. Place the single-use electrodes at the corresponding locations. Connect all electrodes by connecting cables, which are marked with the respective letter and – in the case of limb electrodes – the respective color.

The places for fixing the electrodes

Limb leads:	red electrode:	right hand wrist
	yellow electrode:	left hand wrist
	green electrode:	left foot
	black electrode:	right foot
Chest leads:	V_1	4th intercostal space right from the sternum
	V2	4th intercostal space left from the sternum
	V4	5th intercostal space in the left medioclavicular line
	V3	between V2 a V4
	V5	5th intercostal space in the left front axillar line
	V6	5th intercostal space in the left medial axillar line

Working with PC:

1. Launch the application ECG-Seiva (the icon with a heart)
2. Press **Ins** and set the name and surname of the experimental subject; the other values are not relevant for this practical. Confirm by pressing **CTRL+Enter**. Press twice "**Beru na vědomí**".
3. By pressing F_4 activate ECG recording.
4. Press F_4 to start ten-second ECG recording; it is necessary for the experimental subject to stay calm. Recording will terminate automatically.
5. Print the record by pressing F_6.
6. To return to the main menu, press Alt+F_4. To examine the next experimental subject, repeat the procedure from step 2.
7. Terminate the program by repeatedly pressing **Alt+F$_4$**

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Evaluating an ECG record:

1. **Heart rhythm:**
   - **Regularity:** Is the heart rhythm regular?
     - YES (heart rhythm is regular)
     - NO (heart rhythm is irregular)
   - **Rhythm source:** Is each QRS complex preceded by P wave?
     - YES (sinus rhythm)
     - NO (idiopathic rhythm)
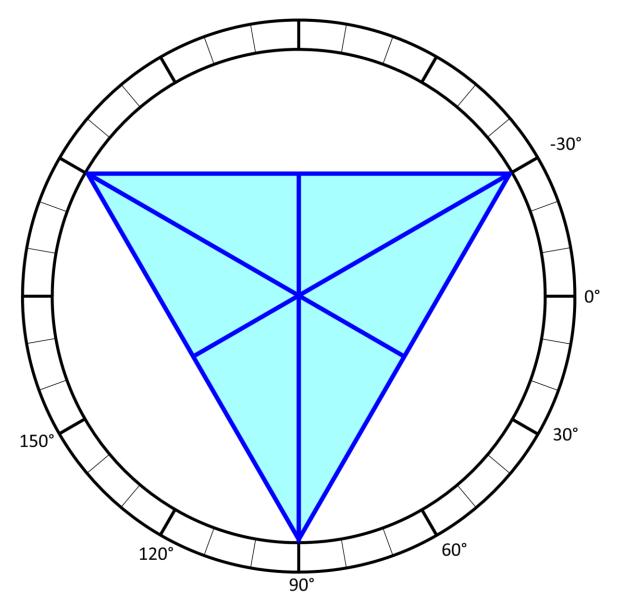2. **Heart rate:**
   - from PC:………………………………………………………..
   - calculation from paper speed (25 mm/s)…………………………
   - evaluation according to ECG ruler……………………………..
3. **Duration of:**
   - RR interval…………………………………
   - PQ interval………………………………….
   - QRS complex………………………………..
   - QT interval………………………………….

Challenge: estimate the Sokolow-Lyon index [S wave (V_1 or V_2) + R (V5 or V6)]:

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(> 35 mm = left ventricle hypertrophy)

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Construct **electrical axis** of the heart from two limb leads into the Einthoven triangle and measure its angle in frontal plane. Assess its angle in horizontal plane from chest leads.

Conclusion

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