Example

* Steps to read ECG

① P wave before every complex called sinus rhythm

② PR intrval
- not < 3 boxes "means no WPW syndrome, no LGL syndrome"
- not > 5 boxes "means no AV block"

③ Heart rate
- regular = $\frac{300}{\text{n. of large boxes}}$
- Irregular

④ Axis of the heart
- normal
  - lead I ⊕ and aVF ⊕
  - lead I ⊕, aVF ⊖ and lead II ⊕
- Rt axis → lead I ⊖ and aVF ⊕
- Lt axis → lead I ⊕, aVF ⊖ and lead II ⊖

⑤ find the most equiphasic lead then the perpendicular lead then the angle

⑥ look at ST segment
- normal : isoelectric line
- elevated
  - Convex → in myocardial infarction (MI)
  - Concave upward → pericarditis, early repolarization phenomena (normal)
- depression
  - Horizontal → 99% it is ischemic
  - Down slopping → 50% ischemic, 50% Strain
  - up slopping → tachycardia "normal"

* TP segment: is the most isoelectric line not PR segment because it may be elevated or depretion
* pericarditis cause PR depretion

⇒ Here I have to say the lead and the type of the segment, diagnosis

⇒ look at example 4, 5, 6, 7 in the book

⑦ look at QRS complexe → Amplitude "means how the long of R"
→ Duration "how the width of the complex"

* [R wave] بتكبر بالتدريج من V_1 الى V_6 و [S wave] العكس
* وبما في muscle يعني في R طويلة
* لو صار Lt ventricle hypertrophy, راح تصير R في V_5, V_6 طويلة , V_1, V_2 ال S عميقة
* لو صار Rt = راح = في V_1, V_2 = و V_5, V_6 = =
* لما أروح Rt axis يعني في مشكلة على Rt
* Normal duration of QRS complex < 3 boxes
* بس ما أشوف wide QRS duration احتمال يكون في bundle block Rt او lt ⑧
M زي hypertrophy على V_5, V_6 يعني lt و V_1, V_2 يعني Rt واذا لقيت حرف
في V_5, V_6 يعني في Lt وبلاقي deep wide S

⑧ look at T wave
* T wave بتساوي R wave في V_1 و V_2
* بحكي انها كبيرة ومش طبيعية لما تصير T قد R في V_1, V_2, V_3 او اطول
→ peaked T wave → hyperkalemia , Ischemia MI
→ Flat T wave → hypokalemia

* K^+ level → normal : 3.5-5.5 mEq/L
peaked T wave: 5.5-6.5
wide of QRS complex and P wave: 6.5-7.5
Very wide complex, no P wave: 7.5-8.5
" death " Sine wave : > 8.5

* في hyperkalemia بوقف القلب على diastole عكس hypercalcemia على systole
* في hypokalemia بتجيه U wave وتسمى Camel hump apperance
* V_1 و V_2 بسميهم Septal leads
* لو في ST elevation من V_1 الى V_4 تسمى antero septal
من V_1 الى V_6 تسمى anterolateral أو massive MI

⑨ look at QT interval
- → prolonged cause sudden cardiac death → مهم في الامتحان
- → normal 440 ml/sec "2 large boxes"

→ 2 syndroms cause prolonged QT interval
1. Romano Ward syndrome → without deafness, autosomal dominant
2. Jervell and lange Nielsen syndrome → with deafness, autosomal recessive

ICB لو سمع صوت عالي بموت بنركبلهم

⇒ Acquired causes
1. hypokalemia
2. hypomagnesmia
3. Drugs → antiarthmic drugs

*QT interval prolongation cause Torsade de pointes

type 1 → exercise
type 2 → audial stimulation

* شوفي الأمثلة من 4 الى 36 في الكتاب