

PEDIATRIC
ECG
INTERPRETATION

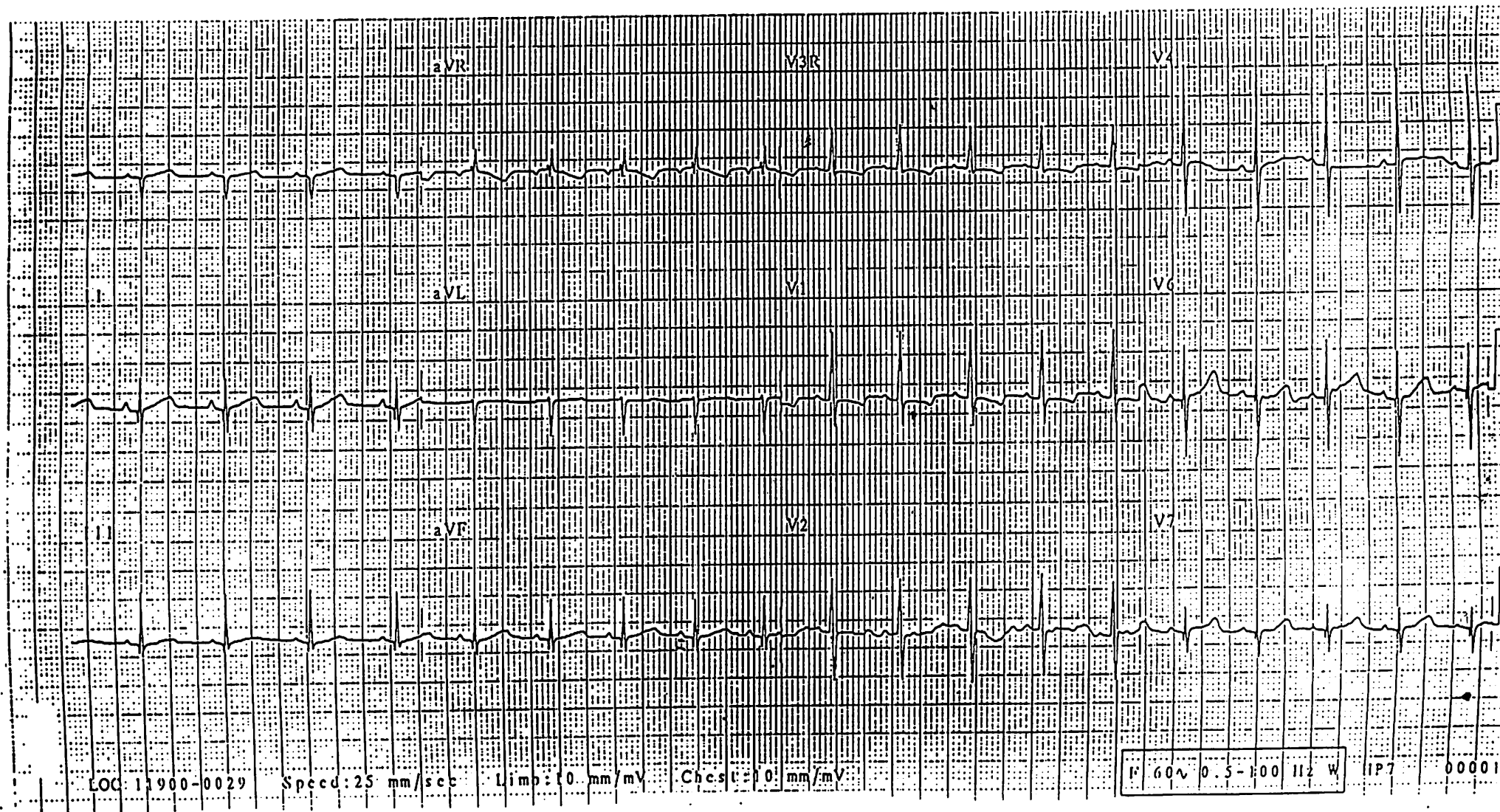
**ELECTROCARDIOGRAM
IN THE
NEWBORN INFANT**

**Benjamin E. Victorica, M.D.
Pediatric Cardiology
University of Florida**

Rate 115
PR 113
QRSD 55
QT 277
QTc 383

1

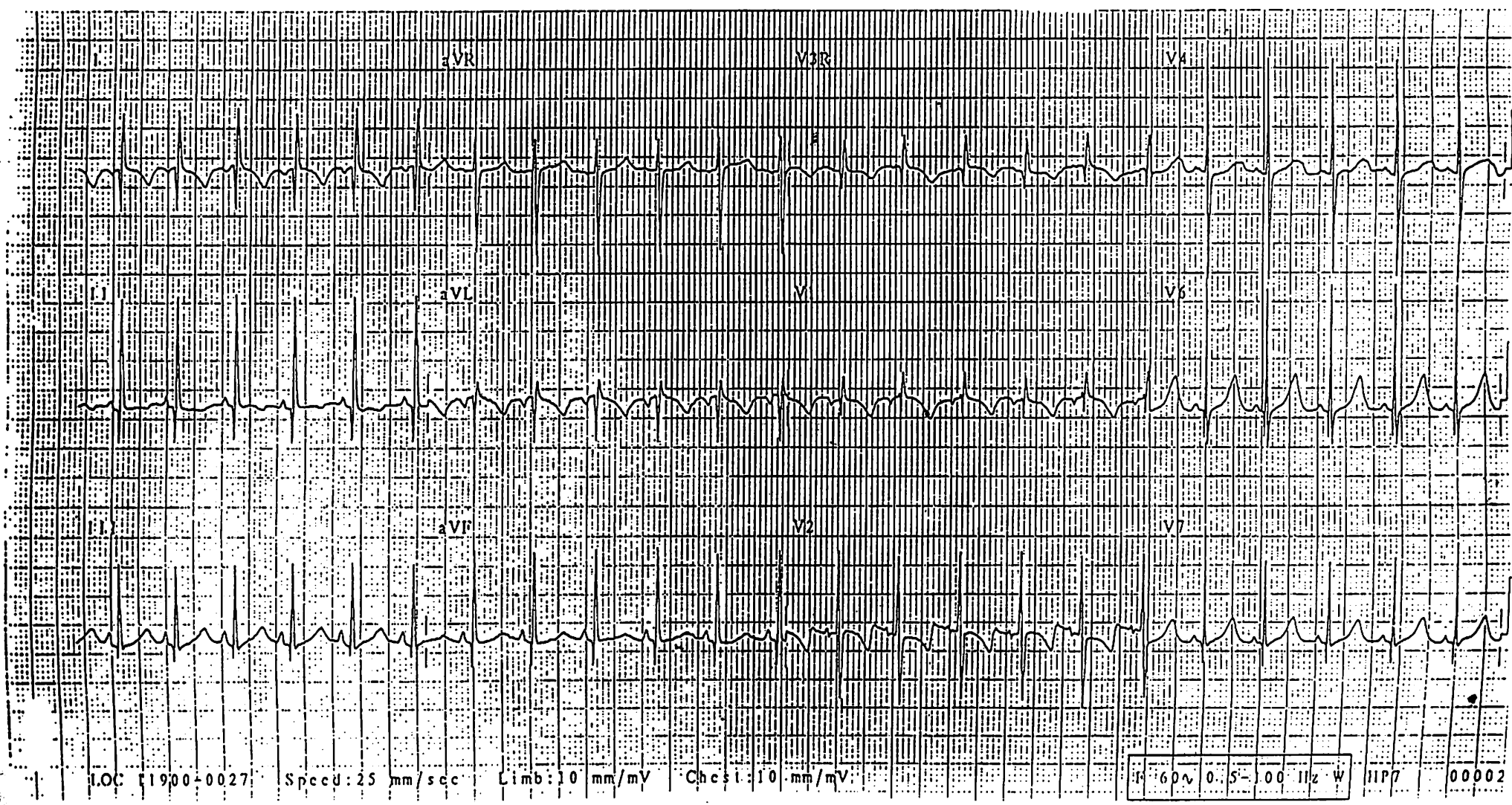
--AXIS--
P 58
QRS 156
T 52



Rate 139
PR 84
QRSD 62
QT 291
QTc 442

2

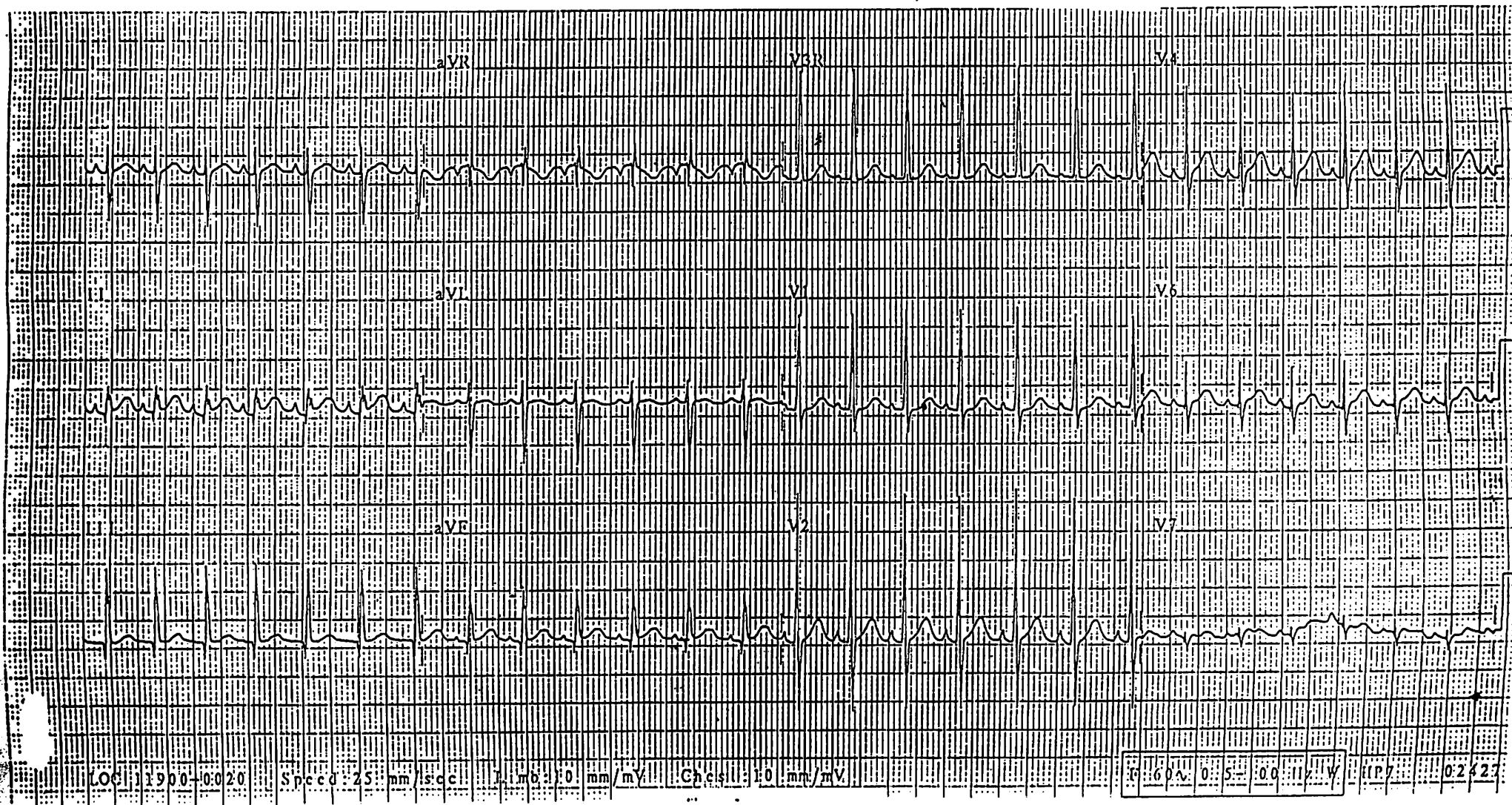
--AXIS--
P 114
QRS 75
T 160



Rate 158
PR 103
QRSD 59
QT ~~228~~ 240
QTc ~~369~~ 394

3

--AXIS--
P 32
QRS 118
T 52



LOC 1900-0020 Speed: 25 mm/sec Limb: 10 mm/mV Chest: 10 mm/mV I: 60V 0: 5: 00 II: V (P) 0: 2: 27

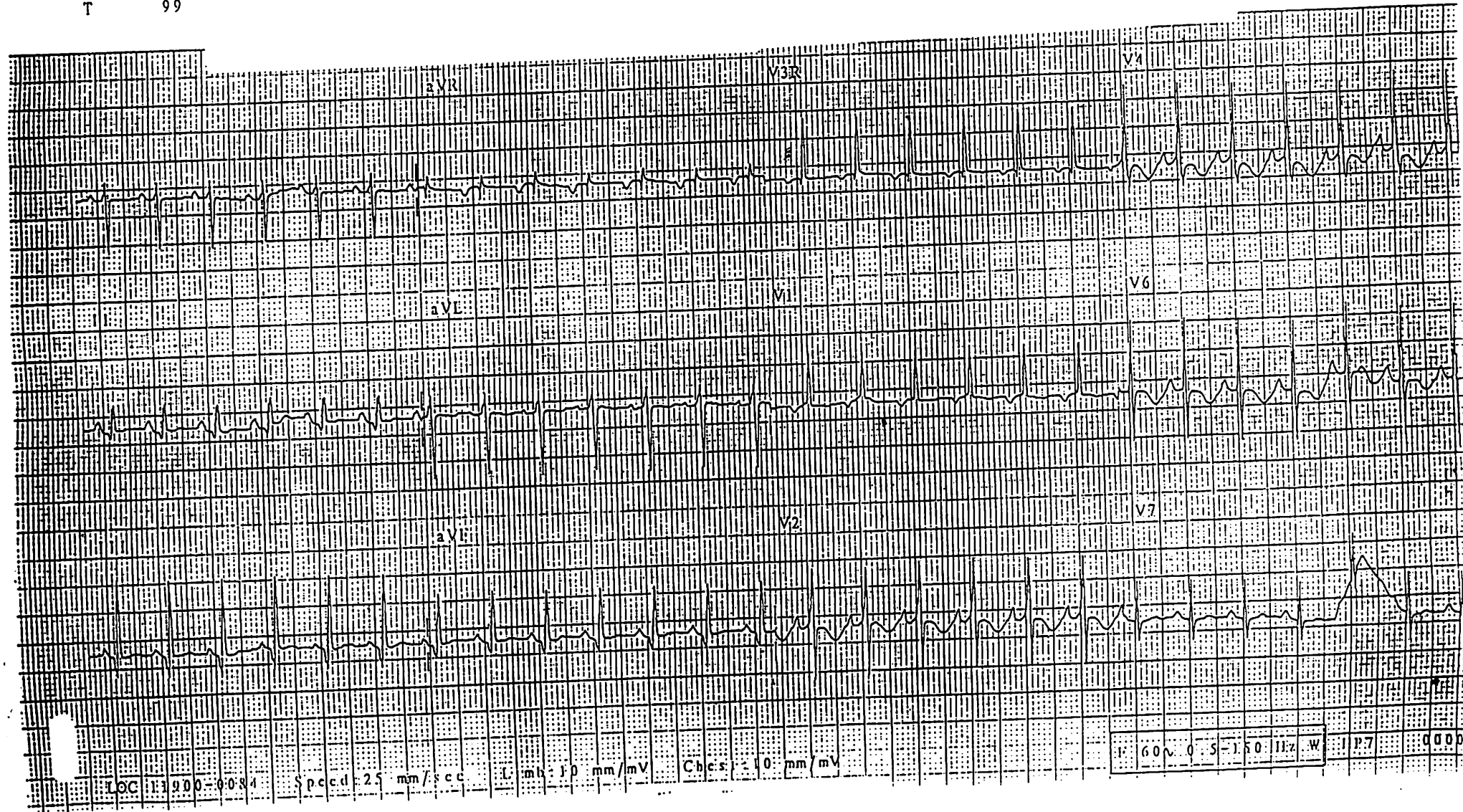
COMMENT:

INDIC. :

4

Rate 152
 PR 124
 QRSD 68
 QT 234
 QTc 372

--AXIS--
 P 62
 QRS 119
 T 99



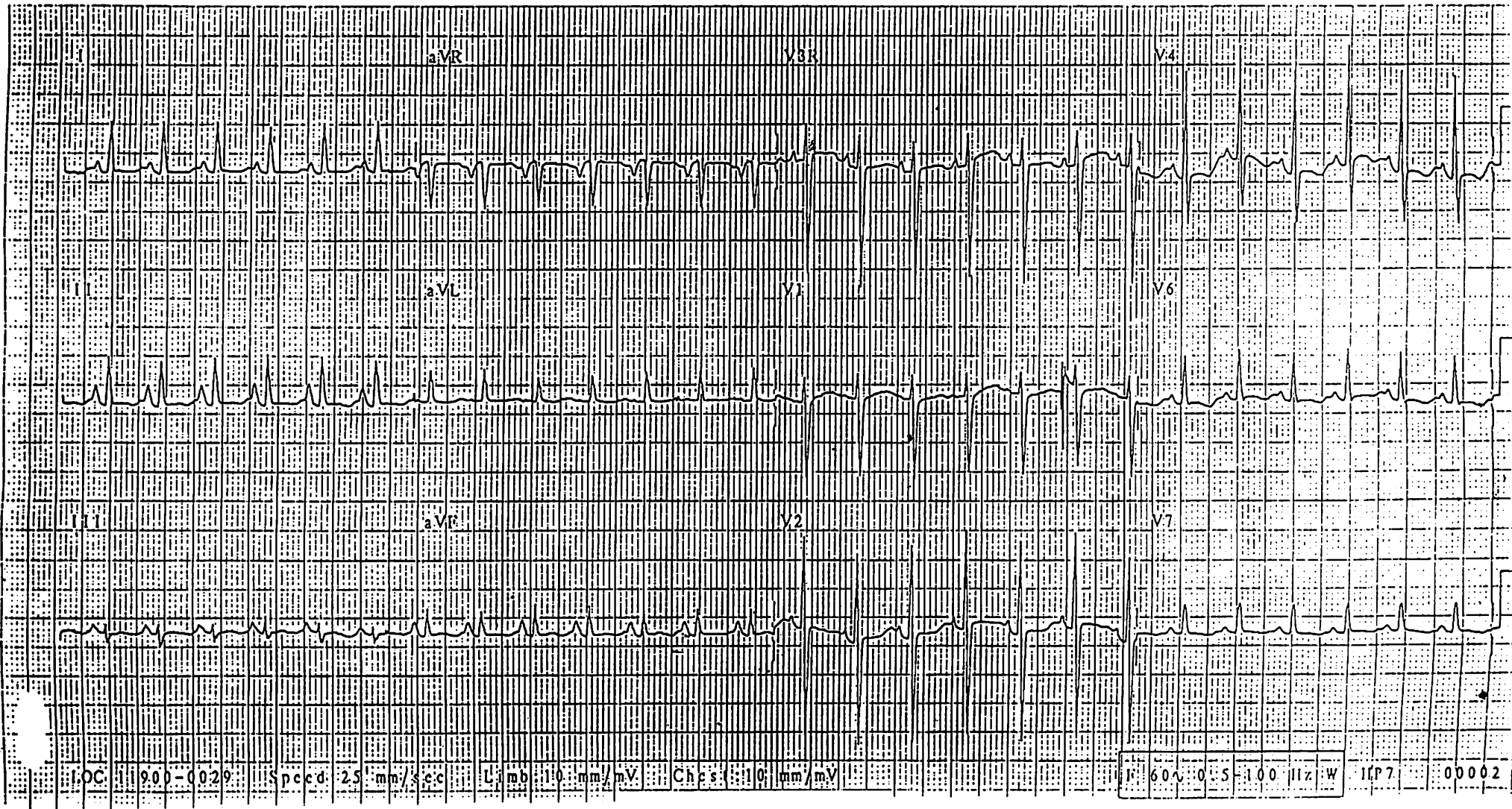
COMMENT.

INDIC
02

Ra... 158
PR 101
QRSD 65
QT 315
QTc 511

5

--AXIS--
P 55
QRS 27
T



**ELECTROCARDIOGRAM IN THE NEWBORN
INTERPRETATION AND DIAGNOSTIC CRITERIAS**

Benjamin E. Victorica, M.D.

#1 10 days-male
Rate 115

- 1) Sinus rhythm- P-QRS sequence with a normal mean P-axis (positive P's in I and aVF). Also indicative of situs solitus.
- 2) Right axis deviation- negative QRS complexes in lead I and positive in aVF.
- 3) Normal septal forces – (q waves in V6-V7) indicate the presence of a left/posterior anatomic left ventricle.
- 4) Normal RV forces – Rs pattern in V1 with negative T waves.

Imp: Normal electrocardiogram.

#2 49 days - male
Rate 139

Right axis deviation of the mean P axis (negative P's in lead I and positive in aVF). Situs inversus? No, because a qR pattern and also negative T's in lead I indicate a technical mistake- reversal of the arm leads! Repeat!

#3 2 weeks - male
Rate 158

- 1) Sinus rhythm – Situs solitus (positive P's in leads I and aVF).
- 2) Right axis deviation.- (negative QRS's in I and positive in aVF).
- 3) Right atrial enlargement – (peaked P's in II and V2).
- 4) Normal septal forces – (q's in V6-V7).
- 5) Right ventricular hypertrophy – (dominant R's and positive T's in V3R-V1). Normally, T waves in V3R and V1 should become negative after a week of age.

#4 1 day - female
Rate 152

- 1) Sinus rhythm – Situs solitus
- 2) Right axis deviation.
- 3) Right atrial enlargement – (prolonged PR interval, should be less than 110 in the newborn, and peaked P's in V2)
- 4) No q's in V6-V7!
- 5) qR pattern in V3R (reversal of septal depolarization) indicate severe RVH or hypertrophy of the right sided ventricle and/or hypoplasia of the left sided ventricle!
- 6) Non-specific ST-T changes.

:

#5 1 day – female
Rate 158

Cyanotic newborn with decreased pulmonary blood flow on CxR

- 1) Sinus rhythm – Situs solitus
- 2) Normal QRS axis!
- 3) Right atrial enlargement
- 4) No septal forces seen in V6-V7 but presence of rS in V3R-V1 suggest normal septal forces.
- 5) Decreased RV forces (rS pattern in V3R-V1).
- 6) Non-specific ST-T changes and a prolonged QTc (>450 ms).

Common congenital cardiac anomalies with cyanosis in the newborn infant due to inadequate pulmonary blood flow:

	ToF	PV atresia	TV atresia	Ebstein's anomaly
QRS axis	RAD	Normal	LAD	RAD
QRS pattern V1	R	rS	rS	rsR'

Diagnosis: Pulmonary valve atresia with a hypoplastic right ventricle.

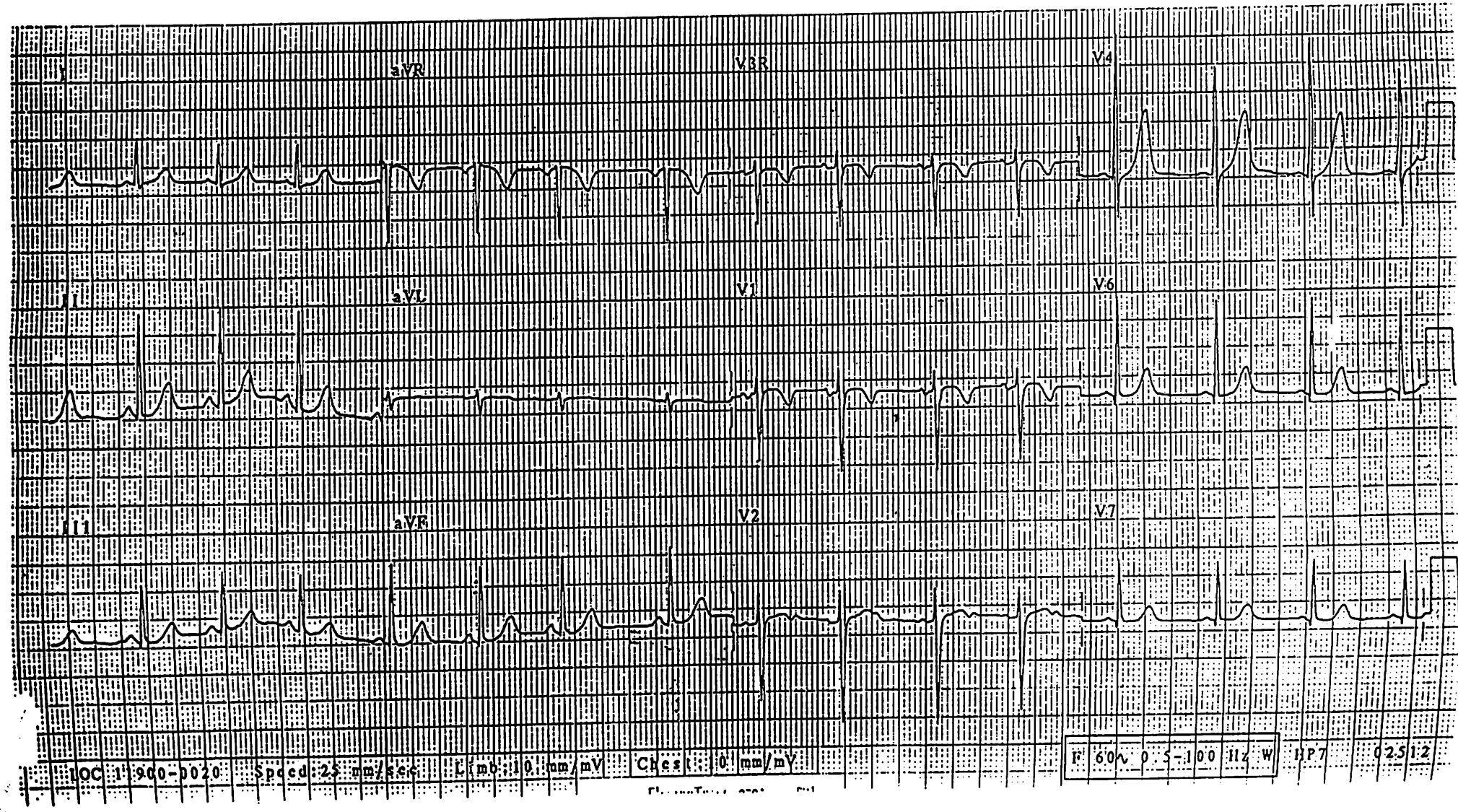
**ELECTROCARDIOGRAM
IN THE
INFANT AND CHILD**

**Benjamin E. Victorica, M.D.
Pediatric Cardiology
University of Florida**

Rate 91
PR 114
QRSD 71
QT 326
QTc 401

1

--AXIS--
P 74
QRS 67
T 59



Rate 99
PR 124
QRSD 88
QT 375
QTc 443

2

COMMENT:
ROUTINE
INDIC
64

--AXIS--
P 40
QRS 76
T 55



7 years Female

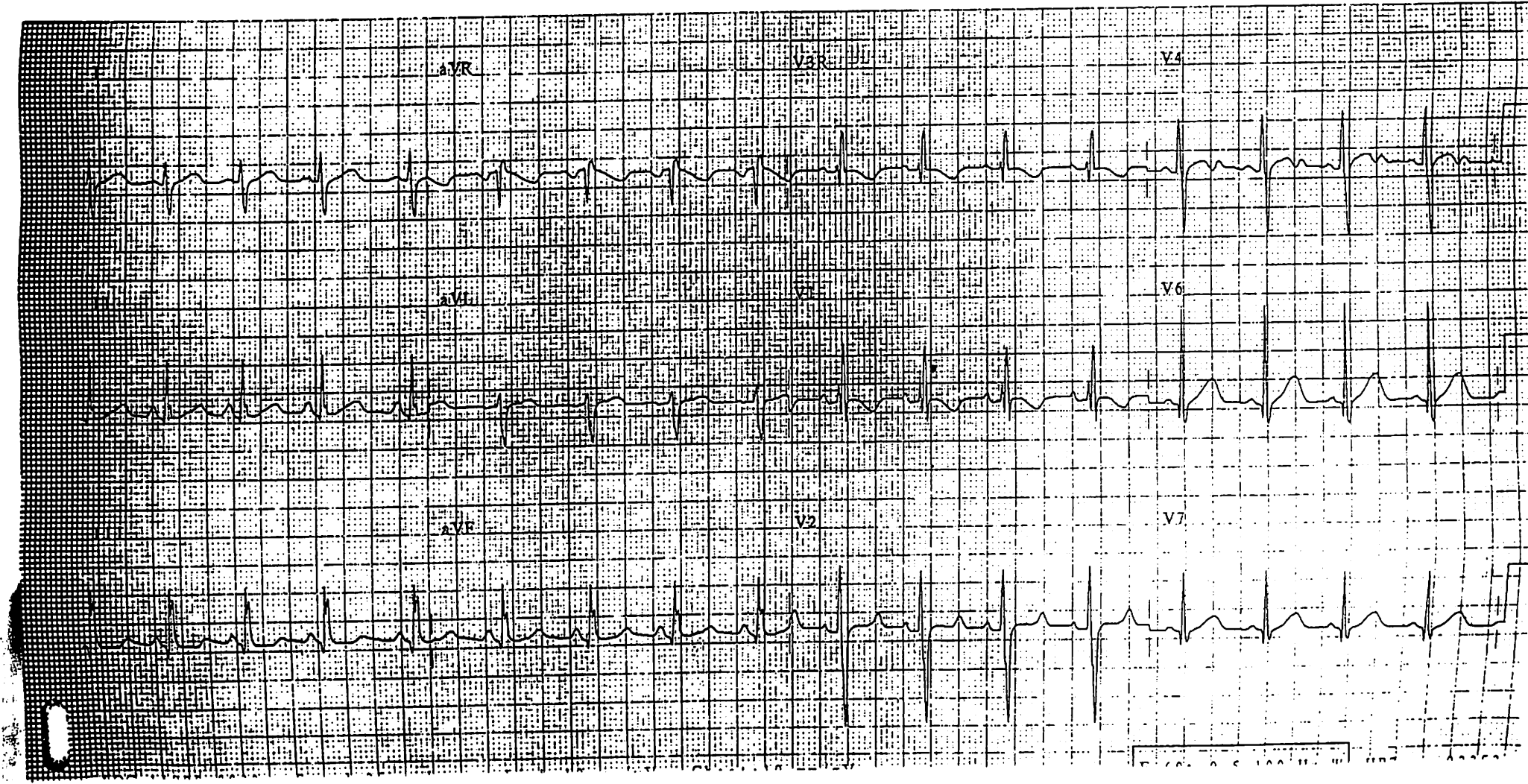
SHAND HOSPITAL
Dej .CS
Room. PEDCL.
Oper: 207

COMMENT:
ROUTINE
INDIC
61

Rate 100
PR 134
QRSD 82
QT 329
QTc 424

3

--AXIS--
P 69
QRS 105
T 42



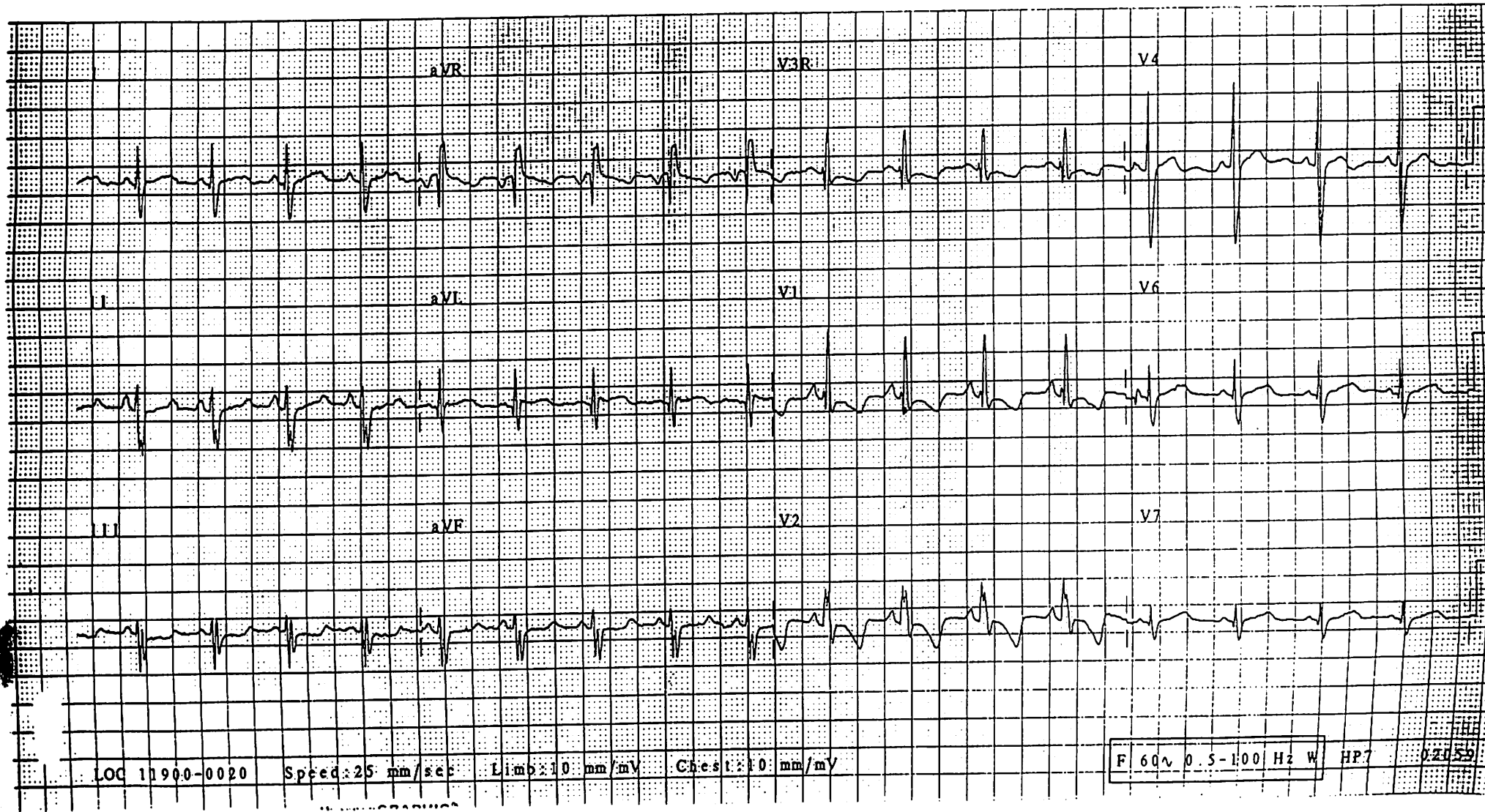
Rate 105
PR 118
QRSD 96
QT 333
QTc 440

COMMENT:

INDIC
61

4

--AXIS--
P 53
QRS 241
T 16



2 months Male

SHAND SPITAL
Dep RT
Room: PED CL
Oper: 223

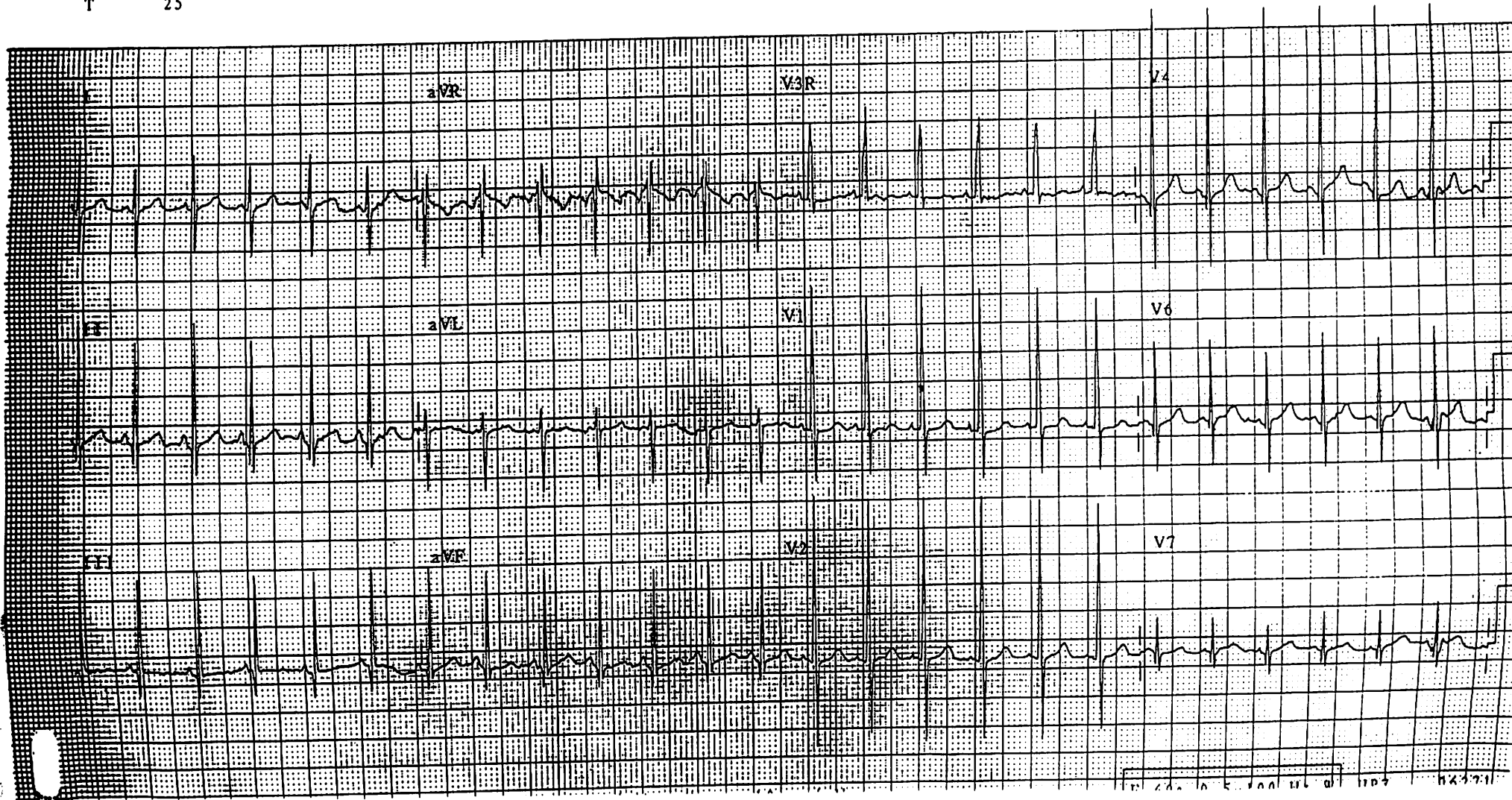
COMMENT:

INDIC
65

Rate 150
PR 78
QRSD 81
QT 248
QTc 390

5

--AXIS--
P 67
QRS 103
T 25



COMMENT:

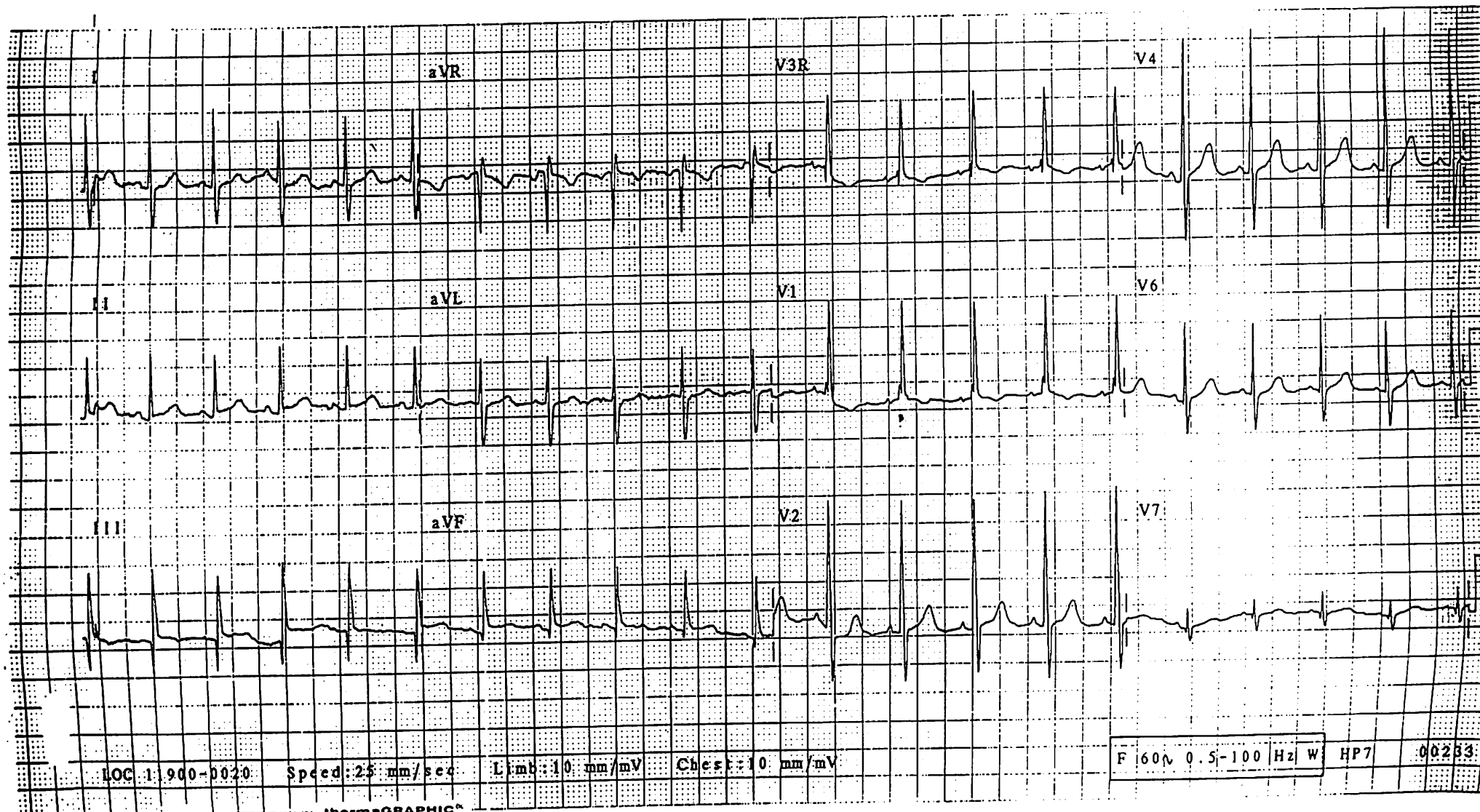
INDIC
67

Rate 120
PR 102
QRSD 67
QT 262
QTc 370

6

--AXIS--

P 13
QRS 90
T 46



COMMENT:

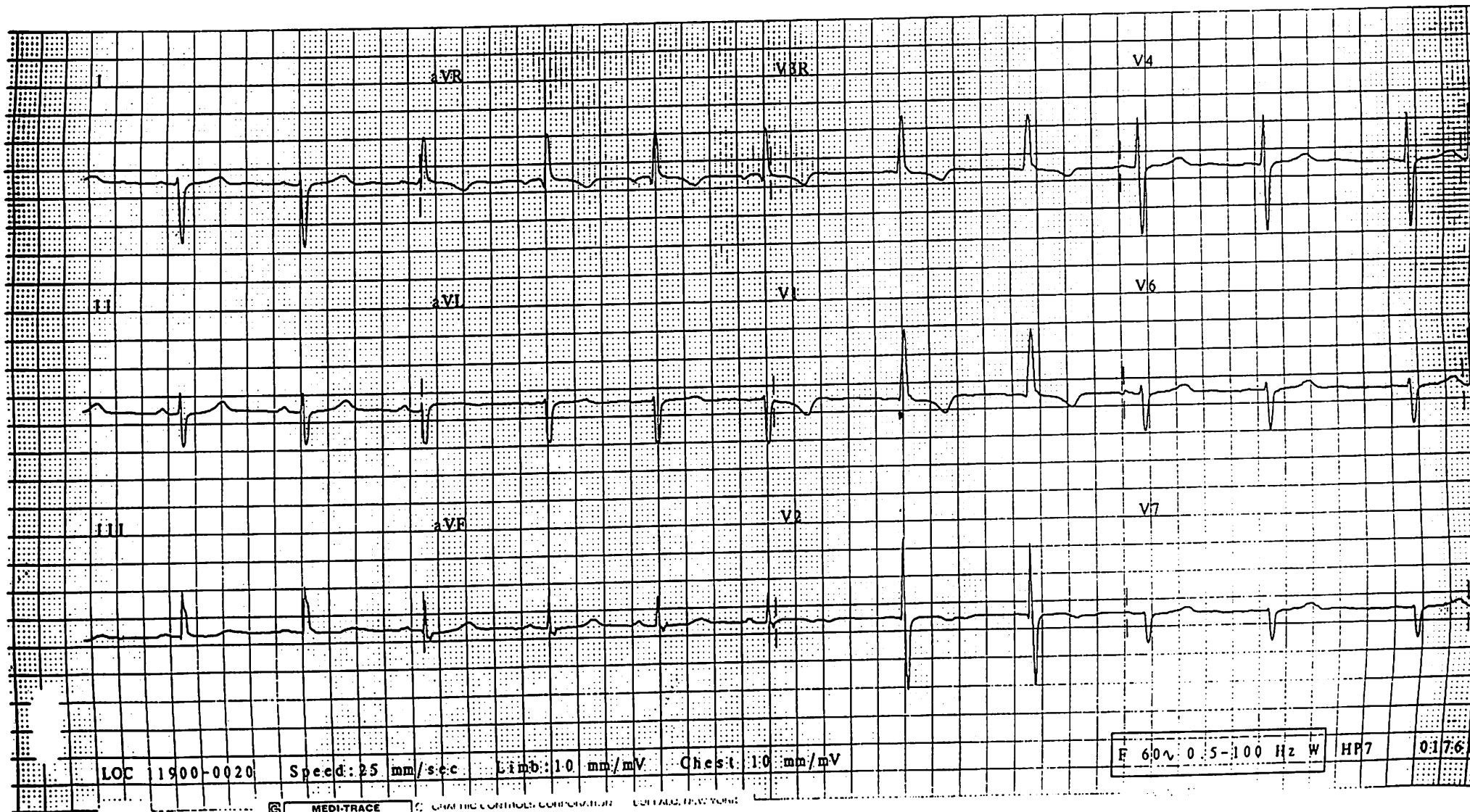
INDIC
68

7

Rate 68
PR 165
QRSD 88
QT 396
QTc 421

--AXIS--

P 62
QRS 170
T 46



LOC 1900-0020

Speed: 25 mm/sec

Limb: 1.0 mm/mV

Chest: 1.0 mm/mV

F 60, 0.5-100 Hz W

HP7

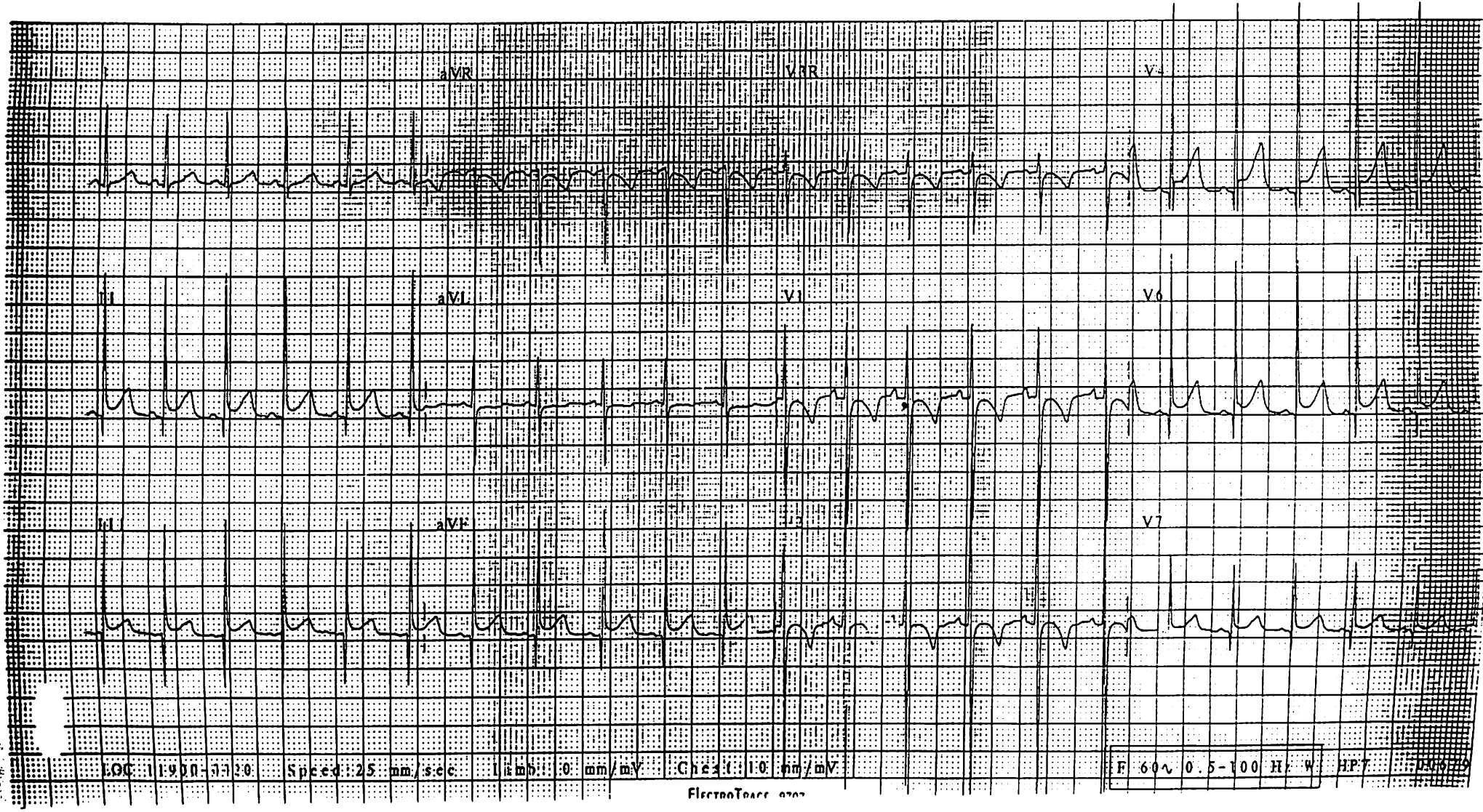
0:17.6

Rate 132
PR 99
QRSD 55
QT 260
QTc 385

8

COMMENT:
ROUTINE
INDIC
82

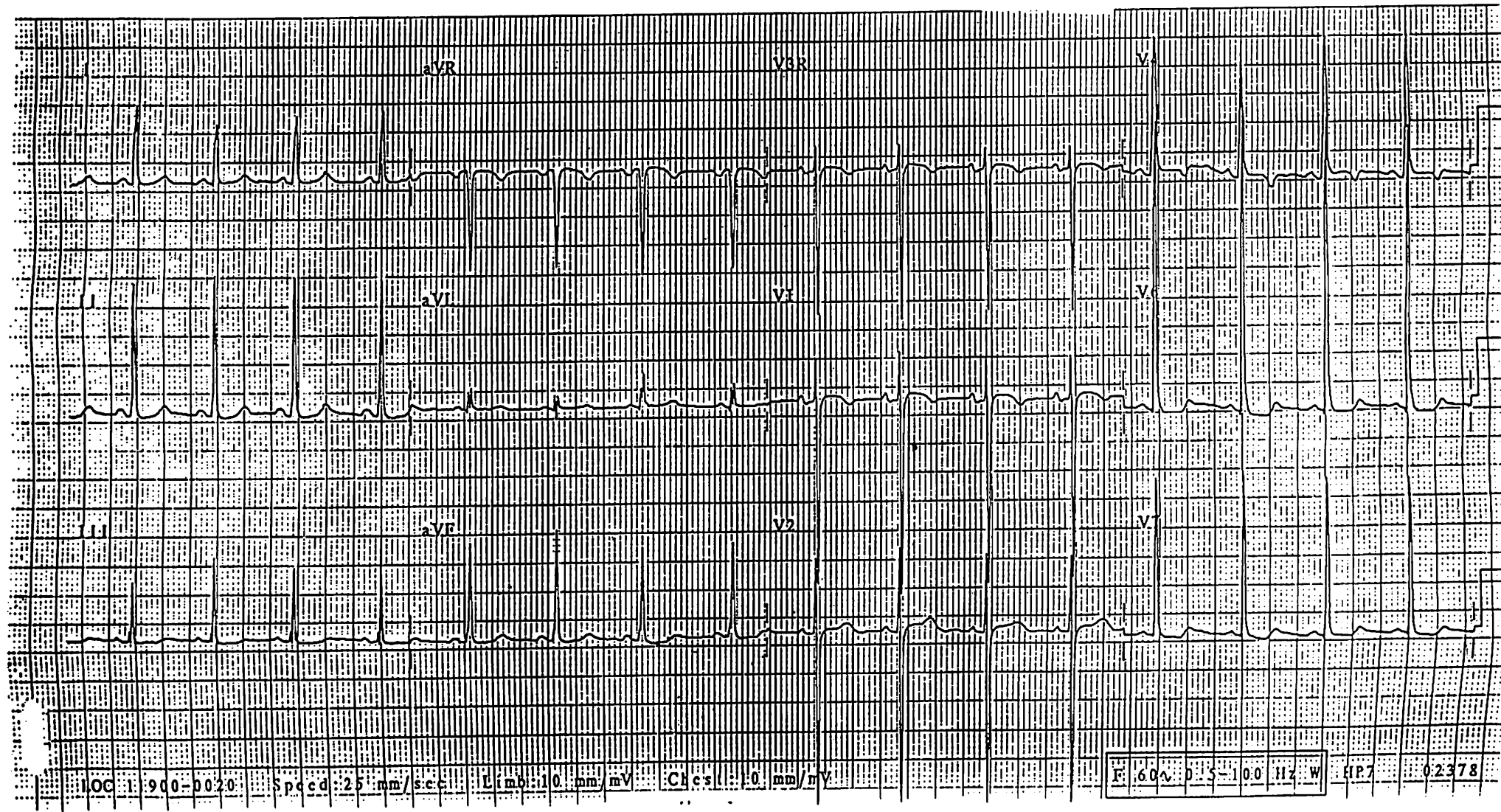
--AXIS--
P 14
QRS 54
T 62



Rate 98
 PR 129
 QRSD 58
 QT 293
 QTc 374

9

--AXIS--
 P 48
 QRS 50
 T 37



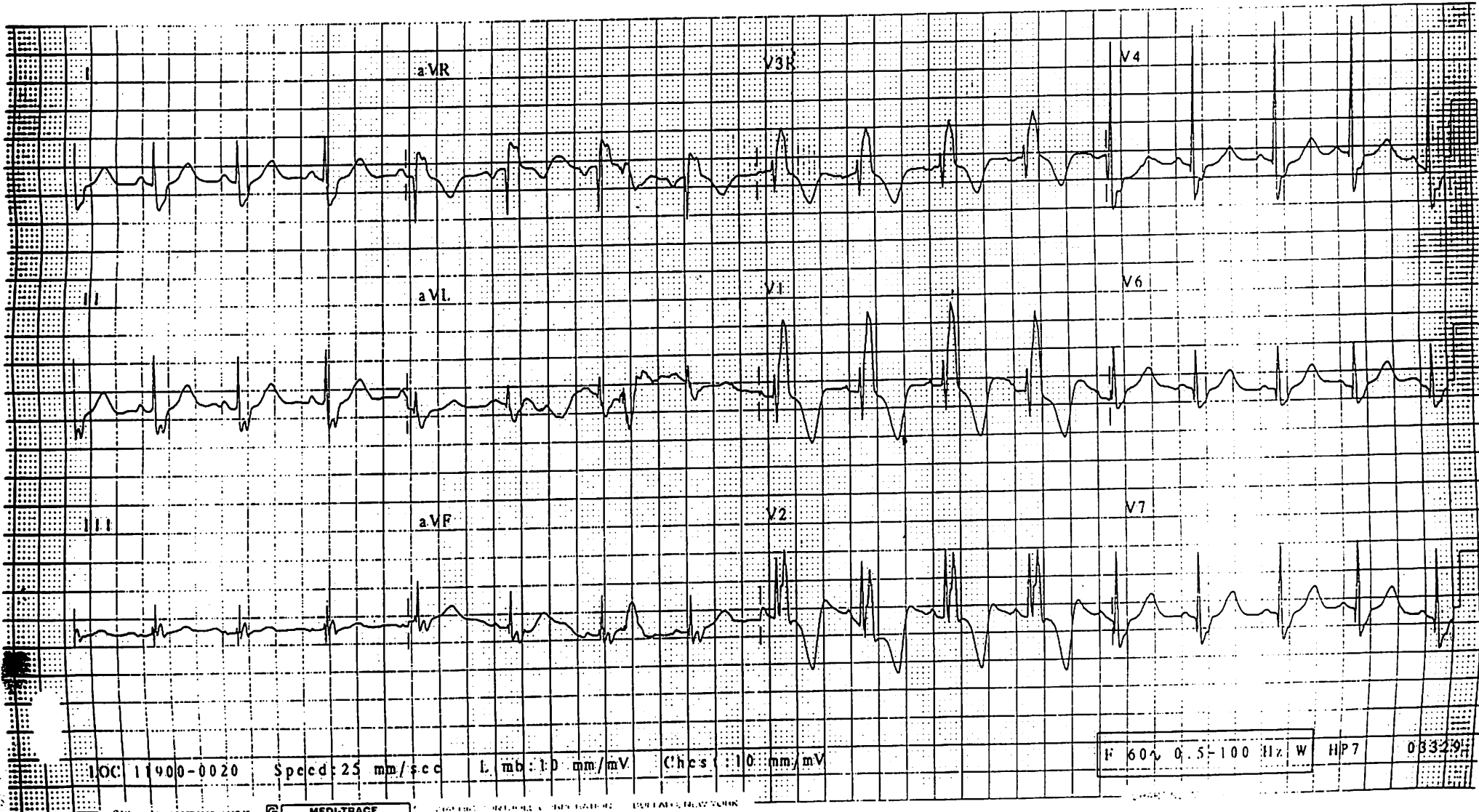
COMMENT:

INDIC
73

Rate 97
PR 130
QRSD 125
QT 367
QTc 466

10

--AXIS--
P 0
ORS 179
T 43



LOC 11400-0020

Speed: 25 mm/sec

L mb: 10 mm/mV

Ches: 10 mm/mV

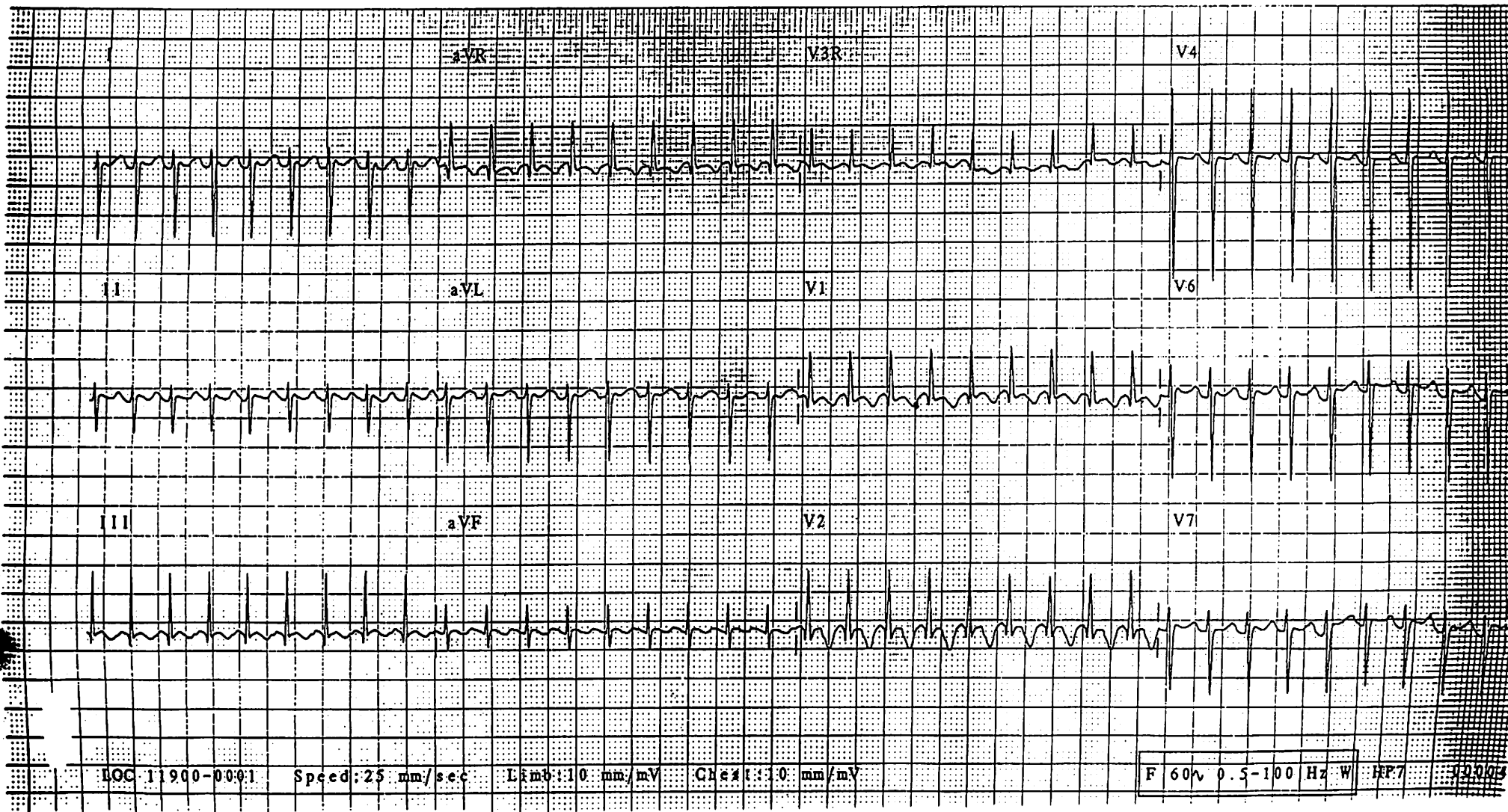
F 60~ 0.5-100 Hz W HP7 08329

Rate 211
PR
QRSD 78
QT 236
QTc 442

11

COMMENT:
STAT
INDIC:
46

--AXIS--
P
QRS 159
T 6



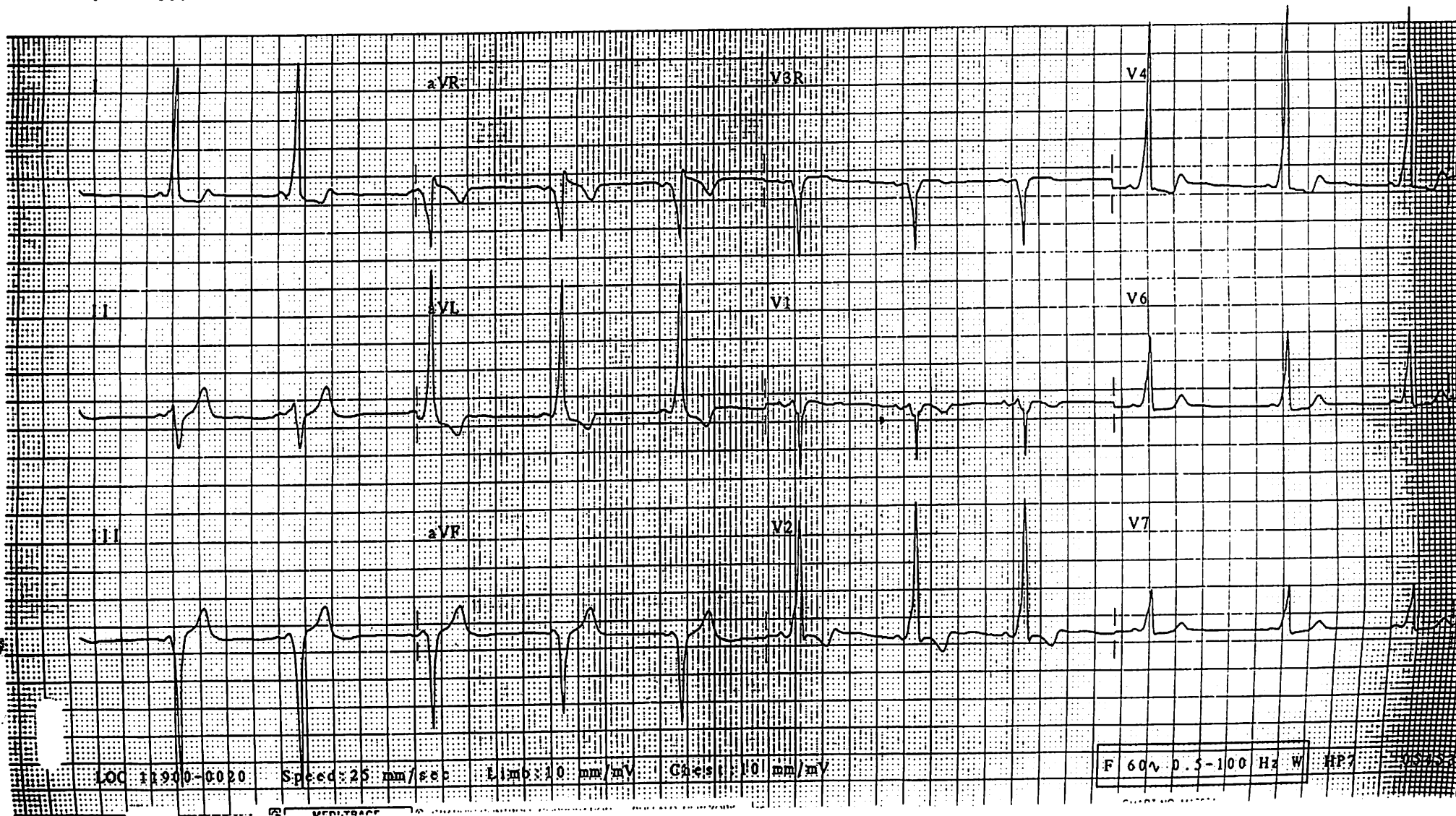
Rate 66
PR 122
QRSD 116
QT 384
QTc 402

12

COMMENT:

INDIC
71

--AXIS--
P -65
QRS -44
T 100



ELECTROCARDIOGRAM IN THE INFANT AND CHILD
INTERPRETATION AND DIAGNOSTIC CRITERIAS

Benjamin E. Victorica, M.D.

#1 4 years Male
Rate 91

- 1) Sinus rhythm - P-QRS sequence with a normal mean P axis (positive P's in leads I and aVF). Also indicative of situs solitus.
- 2) Normal QRS axis (positive QRS complexes in I and aVF).
- 3) Normal PR and QTc intervals.
- 4) Normal septal forces (q waves in V6-V7), indicate the presence of a left/posterior anatomic left ventricle.
- 5) Normal RV forces (rS pattern in V3R and V1 with negative T's).

Imp: Normal electrocardiogram

#2 11 year - Male
Rate 99

Sinus arrhythmia (R-R interval varies with respiration)

Imp: Normal electrocardiogram

#3 7 year Female
Rate 100

- 1) Sinus rhythm – Situs solitus.
- 2) Right axis deviation (negative QRS complexes in I and positive in aVF).
- 3) Right atrial enlargement (peaked P waves in II and V1-V2).
- 4) Normal septal forces (q waves in V6-V7).
- 5) Right ventricular hypertrophy – volume overload (rsR' in V3R-V1).

Clinical diagnosis: Atrial Septal Defect (ostium secundum).

#4 2 years Male
Rate 105

- 1) Sinus rhythm – Situs solitus.
- 2) Superior QRS axis (negative QRS complexes in I and aVF with a qR pattern in aVL).
- 3) Right atrial enlargement (peaked P waves in II and V3R-V1).
- 4) Normal septal forces (q waves in V6-V7).
- 5) Right ventricular hypertrophy – volume overload (rsR' in V3R-V1).

Clinical Diagnosis: Atrial Septal Defect (ostium primum – endocardial cushion defect).

#5 2 months Male
Rate 150

- 1) Mild sinus tachycardia (normal P axis).
- 2) QRS axis at +90
- 3) Normal septal forces (q waves in V6-V7).
- 4) Right ventricular hypertrophy – pressure overload (dominant R waves in V3R-V1 with positive T waves).

Clinical diagnosis: Pulmonary valve stenosis, moderate.

#6 2 months Male
Rate 120

- 1) Sinus rhythm (positive P waves in I and aVF).
- 2) Normal QRS axis or minimal right axis deviation.
- 3) Normal septal forces (q waves in V6-V7).
- 4) Right ventricular hypertrophy – pressure overload at systemic level (100% rR' in V1 with biphasic T waves).

Clinical diagnosis: Tetralogy of Fallot.

#7 15 years Female
Rate 68

- 1) Sinus bradycardia
- 2) Prolonged PR interval (165 ms)
- 3) Right axis deviation
- 4) Abnormal septal forces (no q waves in V6-V7).
- 5) Severe RVH (reversal of septal depolarization with a qR pattern in V3R and V1)

Clinical Diagnosis: Transposition of the Great Arteries, S/P Senning operation for hemodynamic correction.

#8 6 months Female
Rate 132

- 1) Sinus rhythm
- 2) Normal QRS axis
- 3) Normal RV forces (rS pattern in V3R-V1 with negative T's).
- 4) Left ventricular hypertrophy – volume overload (deep q waves in V6-V7 with ST segment elevation (“coving”) and peaked T waves).

Clinical diagnosis: Patent Ductus Arteriosus

#9 6 years Male
Rate 98

- 1) Sinus rhythm
- 2) Normal QRS axis
- 3) Suggest left atrial enlargement (broad P waves in lead II)
- 4) Normal RV forces (rS pattern in V3R-V1 and negative T's).
- 5) Left ventricular hypertrophy – pressure overload with “strain” (small q waves and dominant R waves in V6-V7 with flat ST segments and relatively small T waves).

Clinical diagnosis: Aortic valve stenosis, moderately severe.

#10 4 years Male
Rate 97

- 1) Sinus rhythm
- 2) Right axis deviation (the area of the S waves in I are greater than the area of the R waves).
- 3) Right bundle branch block (slow terminal QRS forces with rsR' pattern with deeply negative ST-T's in V3R-V1 and a QRS duration of greater than 120 ms). QTc is prolonged (>450 ms) secondary to the RV conduction delay).

Clinical diagnosis: S/P repair of a tetralogy of Fallot.

11 Rate 211

Narrow QRS tachycardia with no obvious P waves is consistent with a supraventricular tachycardia.

#12 16 years Male
Rate 66

- 1) Probable sinus rhythm
- 2) Short PR interval
- 3) Left axis deviation (positive QRS complexes in I and negative in aVF).
- 4) Slow initial QRS forces (delta waves) indicate the presence of a Wolff-Parkinson-White syndrome, type B (negative QRS complexes in V3R-V1). This type of W-P-W is seen in Ebstein's anomaly of the tricuspid valve.