Sleep Stages Review

Overview

- Max Impedance = 5000 Ohms
- Min Digital Resolution = 12 bits per sample
- Use 2 pass method
  - 30 second screen for staging and arousals
  - 2 min screen for events
- First determine if epoch is sleep or wake
  - Score stage as most predominant stage

Waveforms

- Alpha = 8-13 Hz
  - Maximal in occipital region
  - Can be seen in any stage
  - Seen best with eyes closed
- Theta = 4-7 Hz
  - Seen in N1 and REM
- Vertex Sharp Wave
  - < 500 msec
  - Maximal in central region

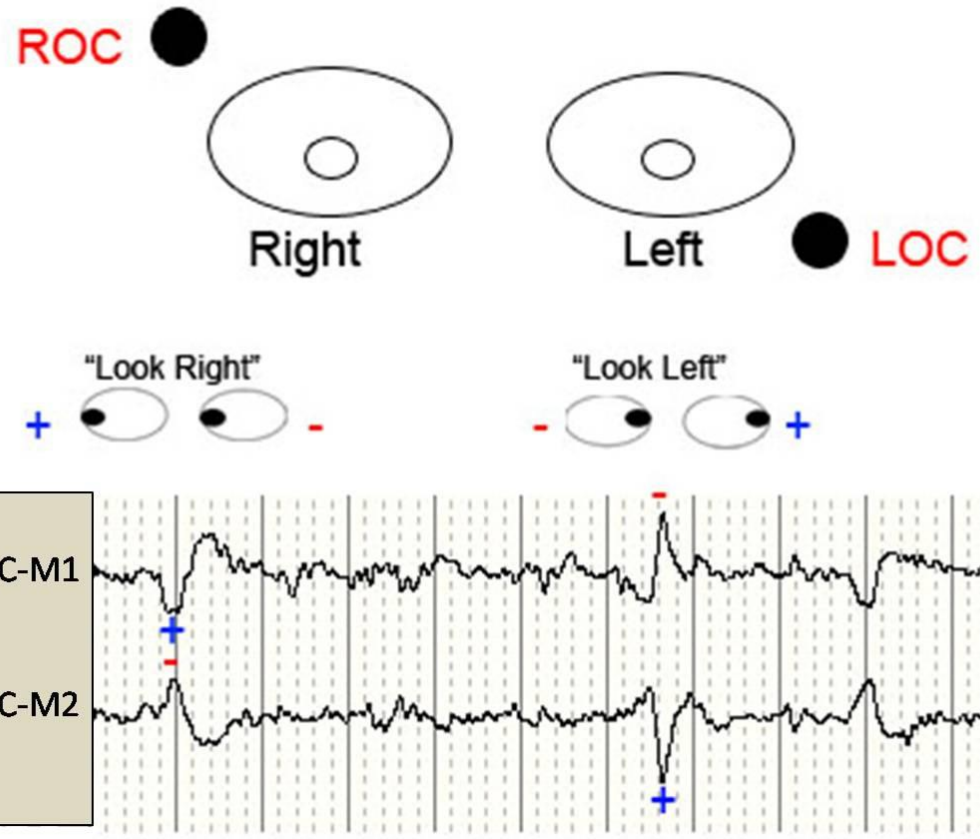
Waveforms

- Spindle = 11-16 Hz
  - Maximal in central region
  - ≥ 0.5 sec
  - Seen in N2
- K Complex
  - High amplitude
  - Stands out from background EEG
  - Biphasic
  - > 0.5 sec
  - Maximal in frontal region
  - Seen in N2

Waveforms

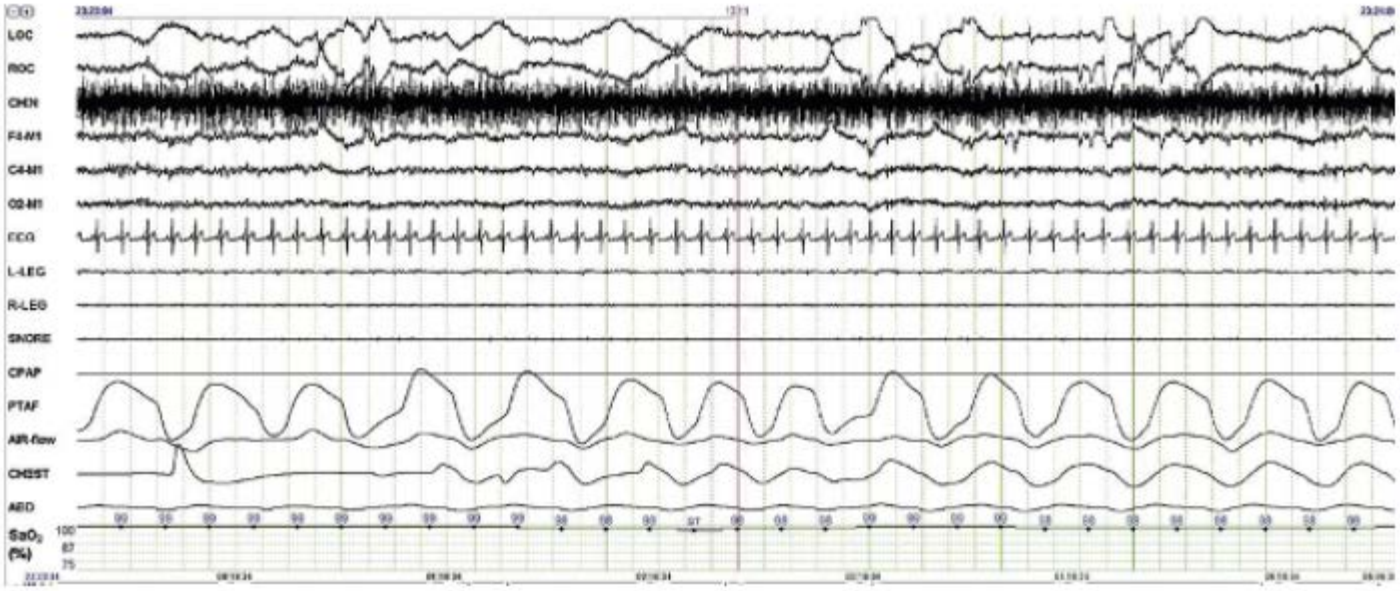
- Delta / Slow Waves = 0.5-2 Hz
  - Maximal in frontal region
  - > 75 uV in height
  - Seen in N3
  - Must have 6 seconds (20%) of deltas in an epoch to be scored as N3
- Sawtooth = 2-6 Hz
  - Serrated looking waveform
  - Maximal in central region
  - Seen in REM

Eye Movements

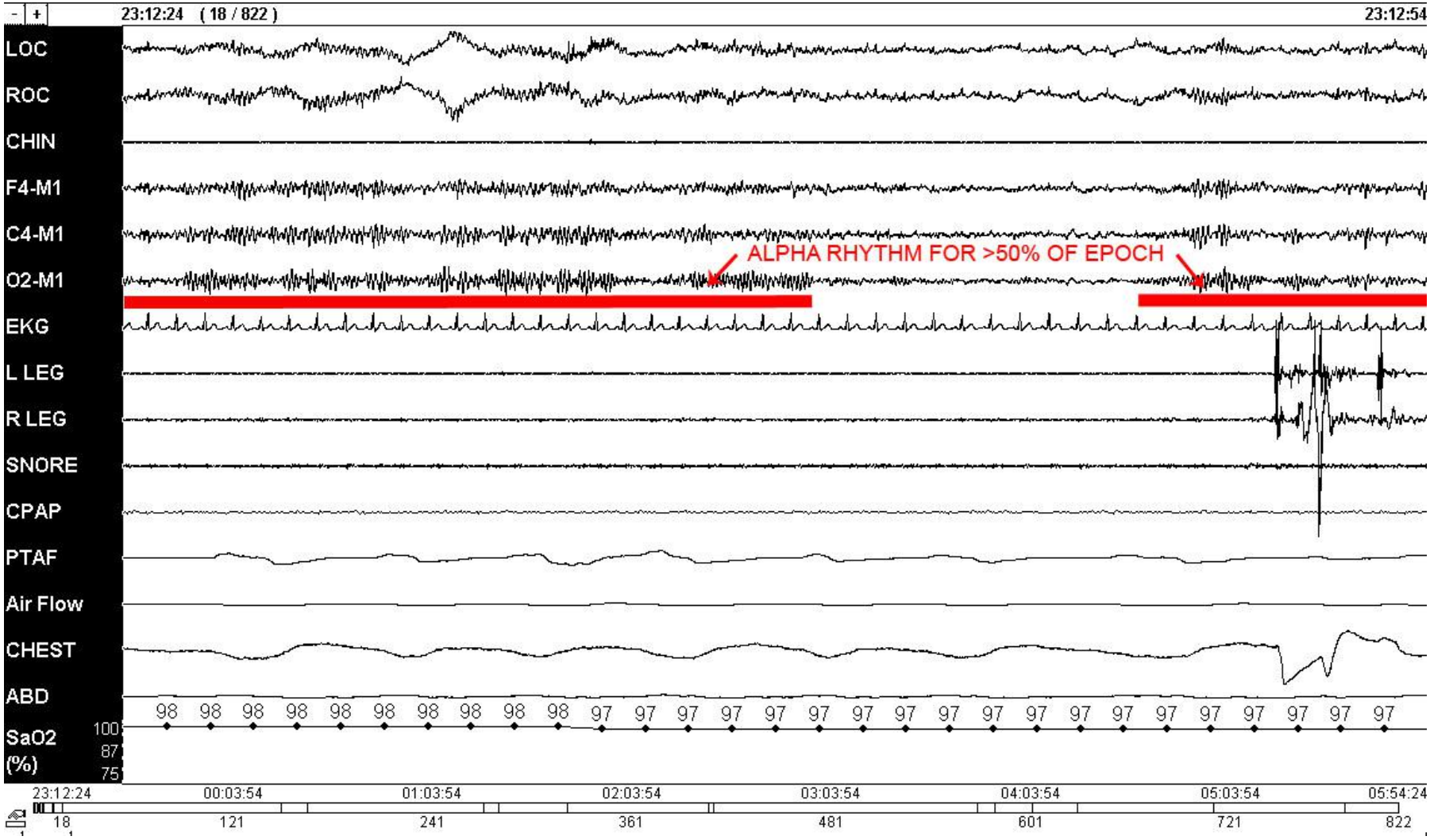


Wake

- Waveform = Alpha
- Eyes = Reading eyes, REM, eye blinks
- Chin = High

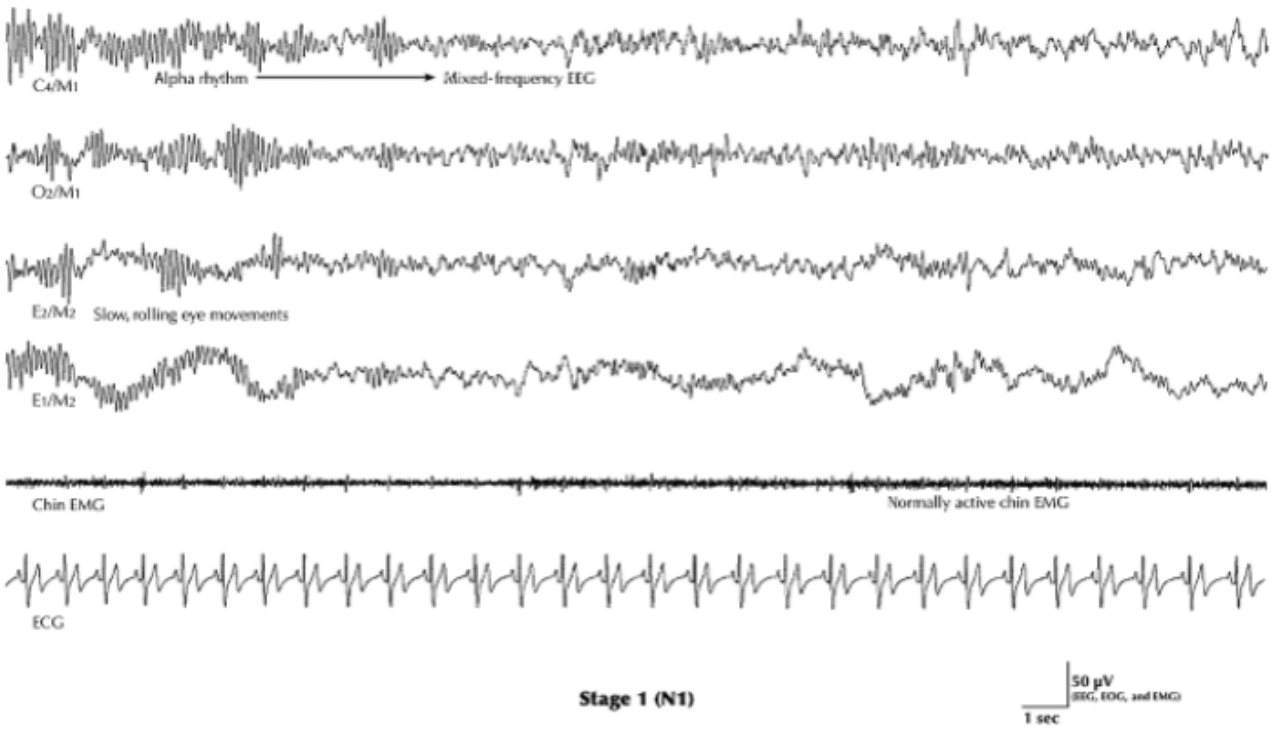


Wake

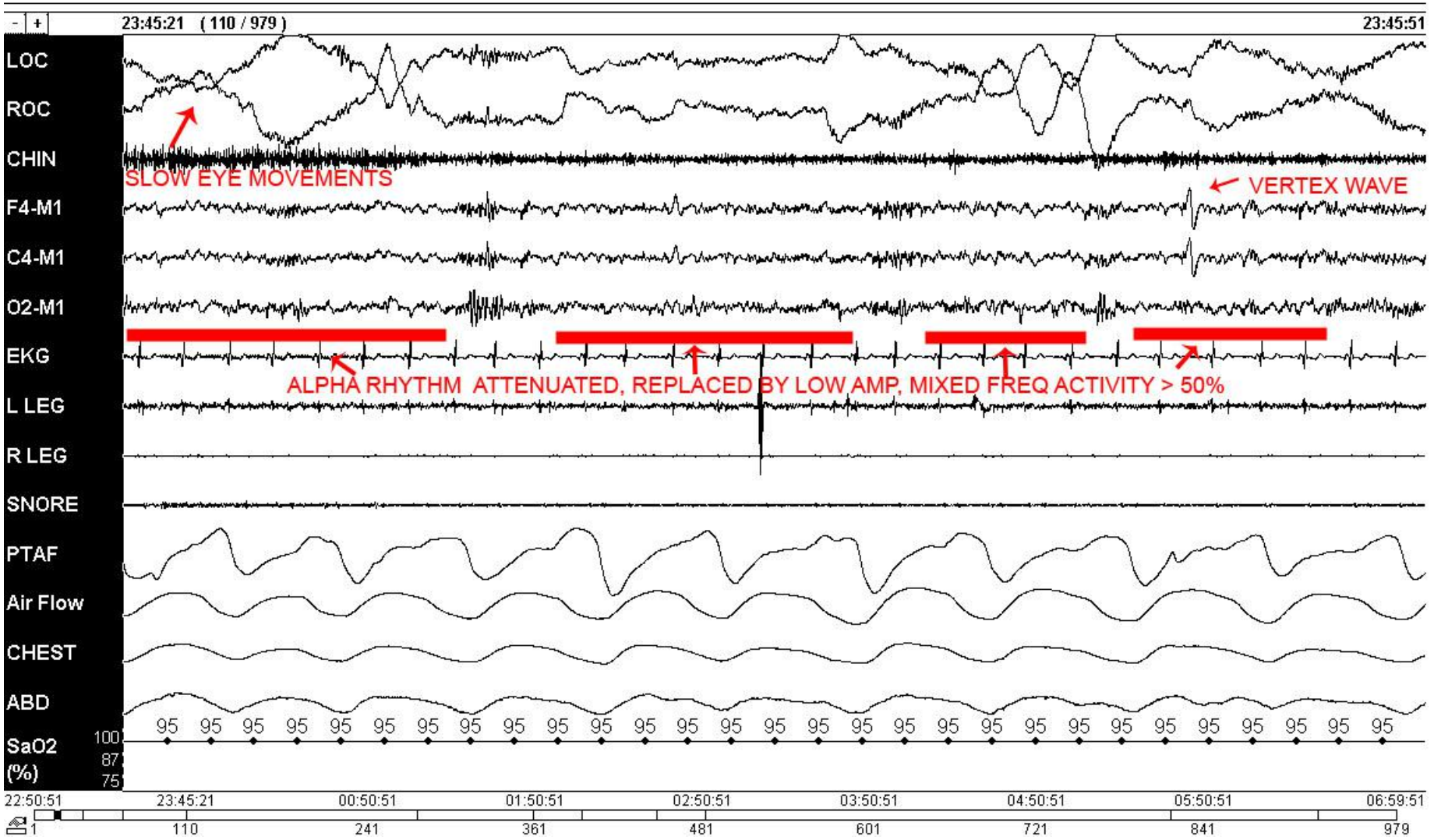

23:12:24 (18 / 822)
23:12:54
LOC
ROC
CHIN
F4-M1
C4-M1
O2-M1
ALPHA RHYTHM FOR >50% OF EPOCH
EKG
L LEG
R LEG
SNORE
CPAP
PTAF
Air Flow
CHEST
ABD
SaO2 (%)
100
87
75
98 98 98 98 98 98 98 98 98 98 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97 97
23:12:24
00:03:54
01:03:54
02:03:54
03:03:54
04:03:54
05:03:54
05:54:24
18
121
241
361
481
601
721
822

N1

- Waveform = Theta and Vertex Sharp Waves
- Eyes = Slow rolling eyes
- Chin = High

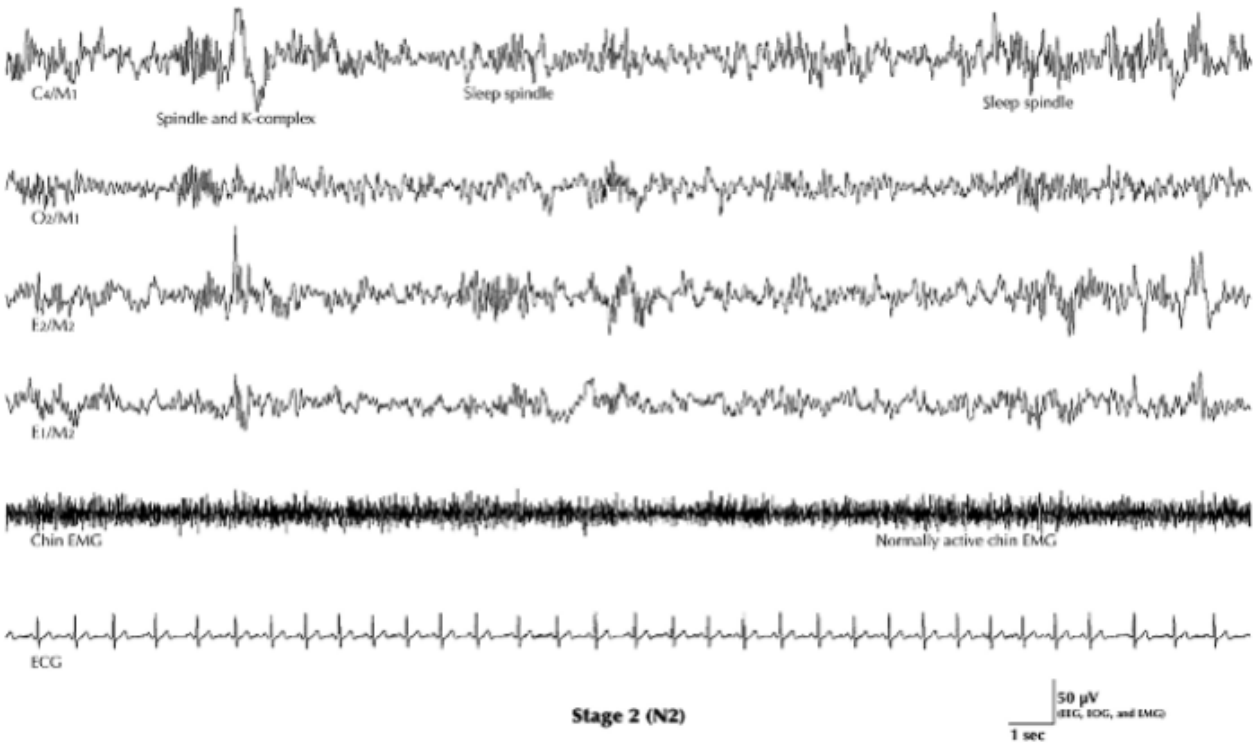


N1

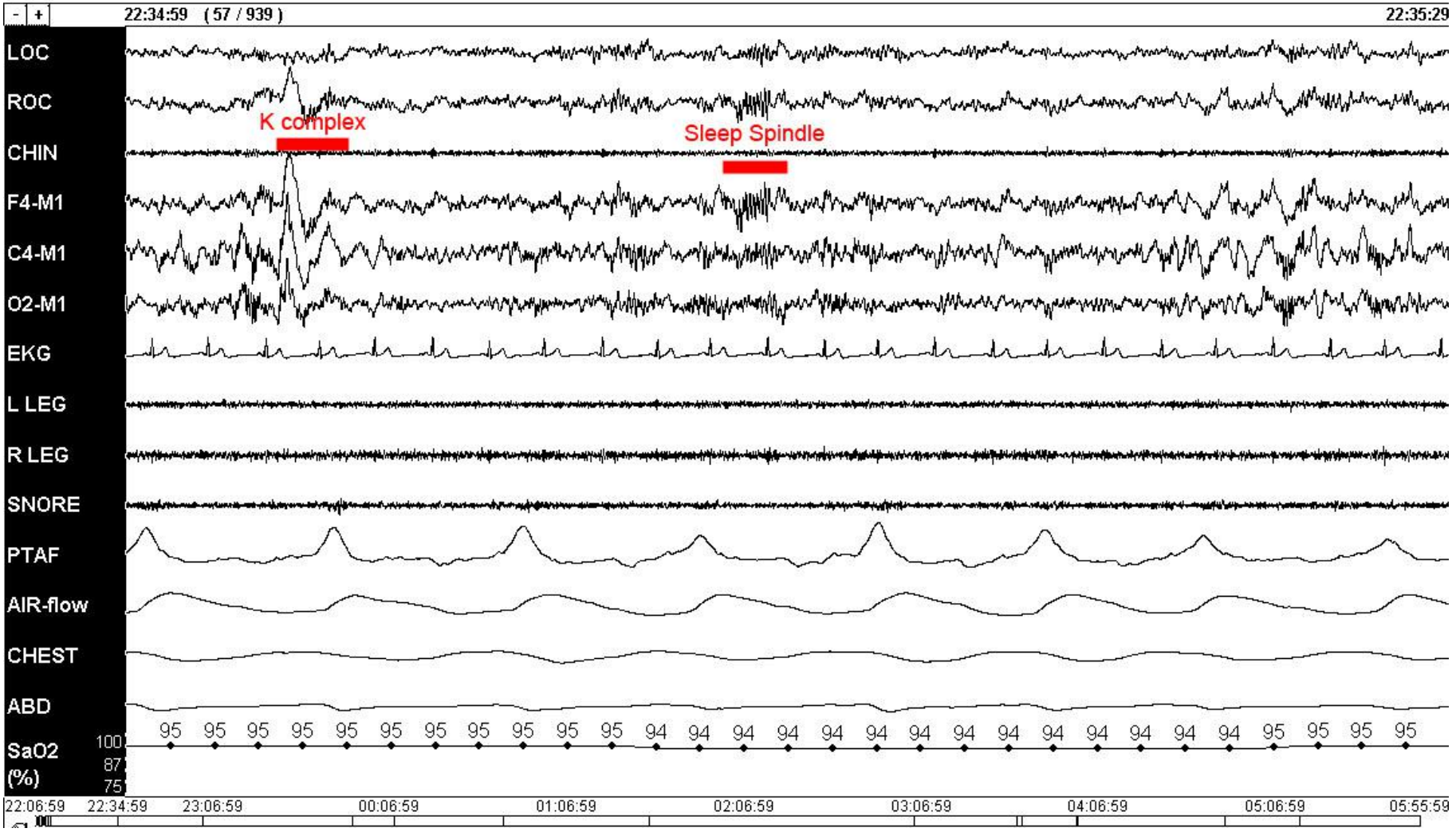

23:45:21 (110 / 979)
23:45:51
LOC
ROC
CHIN
SLOW EYE MOVEMENTS
VERTEX WAVE
F4-M1
C4-M1
O2-M1
EKG
ALPHA RHYTHM ATTENUATED, REPLACED BY LOW AMP, MIXED FREQ ACTIVITY > 50%
L LEG
R LEG
SNORE
PTAF
Air Flow
CHEST
ABD
SaO2 (%)
100
87
75
95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95
22:50:51
23:45:21
00:50:51
01:50:51
02:50:51
03:50:51
04:50:51
05:50:51
06:59:51
1
110
241
361
481
601
721
841
979

N2

- Waveform = LAMF, spindles, K complexes
- Eyes = Straight
- Chin = Lower than Wake

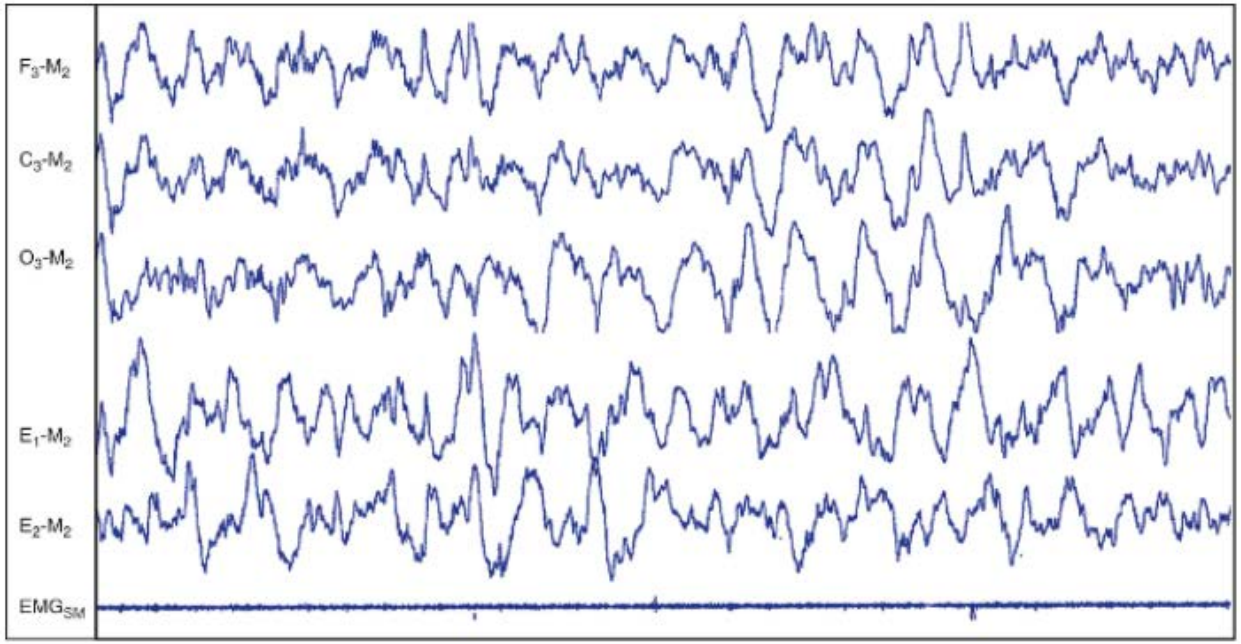


N2

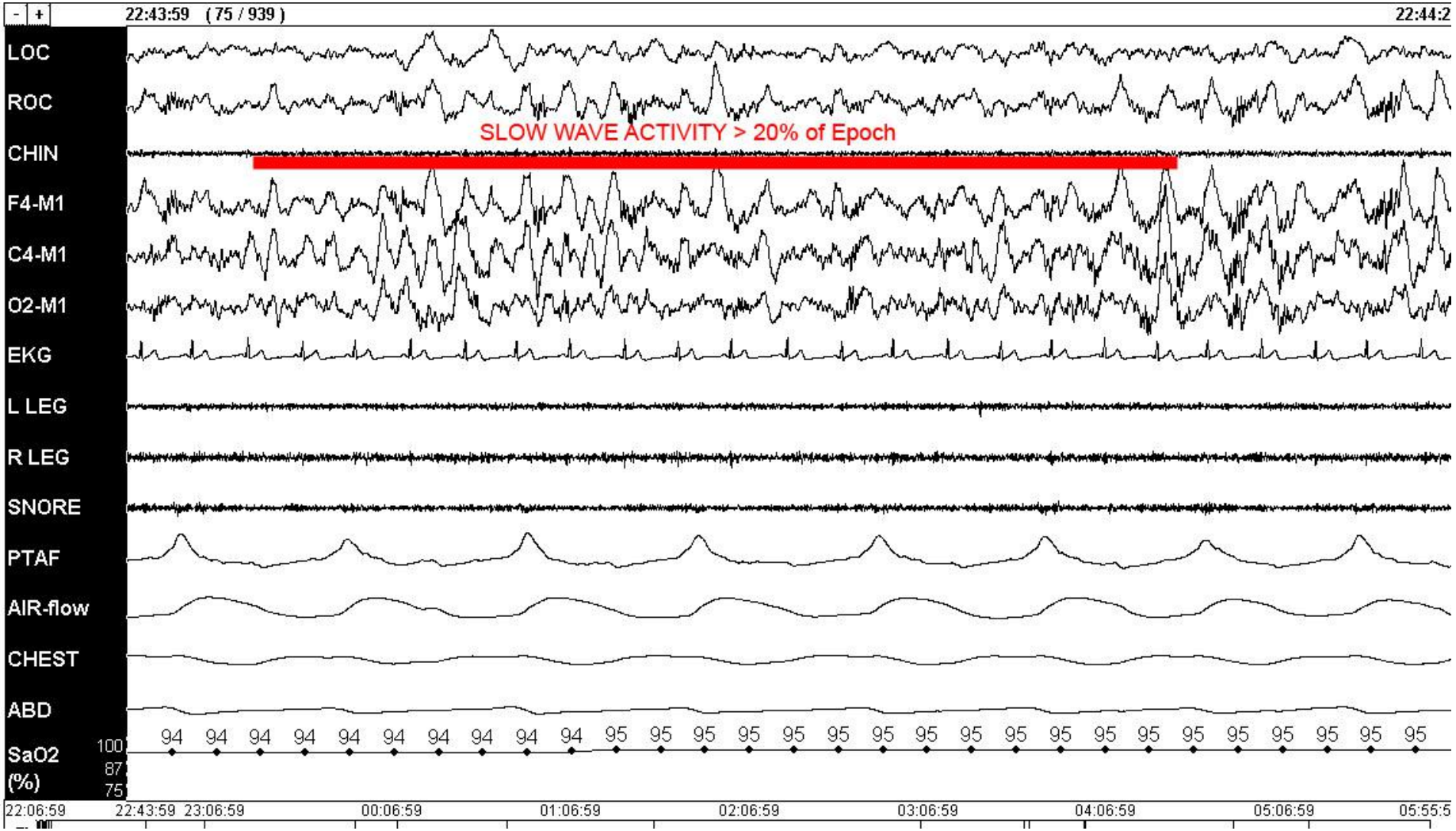

22:34:59 (57 / 939)
22:35:29
LOC
ROC
CHIN
F4-M1
C4-M1
O2-M1
EKG
L LEG
R LEG
SNORE
PTAF
AIR-flow
CHEST
ABD
SaO2 (%)
100
87
75
95 95 95 95 95 95 95 95 95 95 95 94 94 94 94 94 94 94 94 94 94 94 94 94 94 95 95 95 95
K complex
Sleep Spindle
22:06:59
22:34:59
23:06:59
00:06:59
01:06:59
02:06:59
03:06:59
04:06:59
05:06:59
05:55:59

N3

- Waveform = Delta
- Eyes sometimes mirror deltas
- Chin = Lower



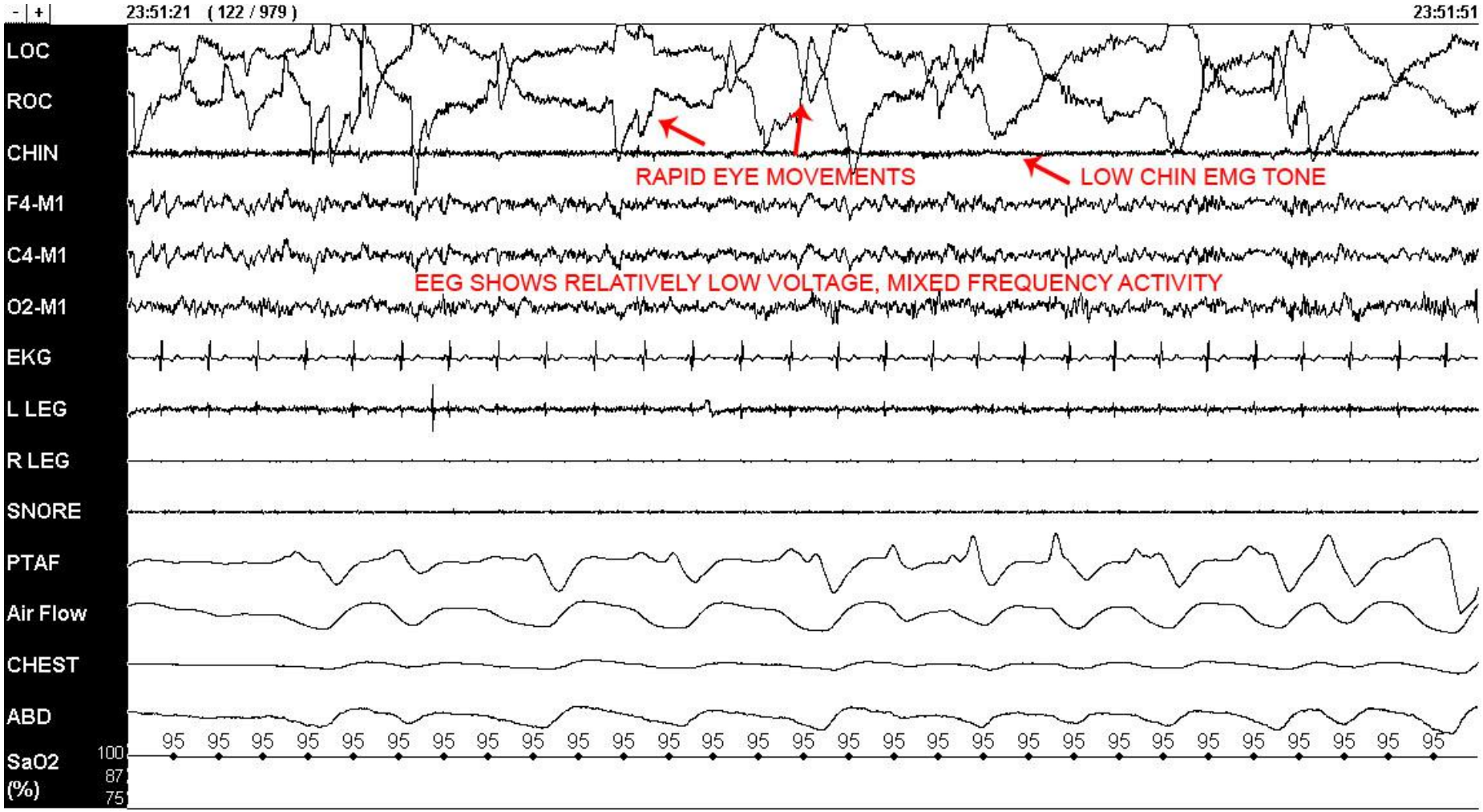
N3


22:43:59 (75 / 939)
22:44:2
LOC
ROC
CHIN
SLOW WAVE ACTIVITY > 20% of Epoch
F4-M1
C4-M1
O2-M1
EKG
L LEG
R LEG
SNORE
PTAF
AIR-flow
CHEST
ABD
SaO2 (%)
100
87
75
94 94 94 94 94 94 94 94 94 94 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95
22:06:59
22:43:59
23:06:59
00:06:59
01:06:59
02:06:59
03:06:59
04:06:59
05:06:59
05:55:5

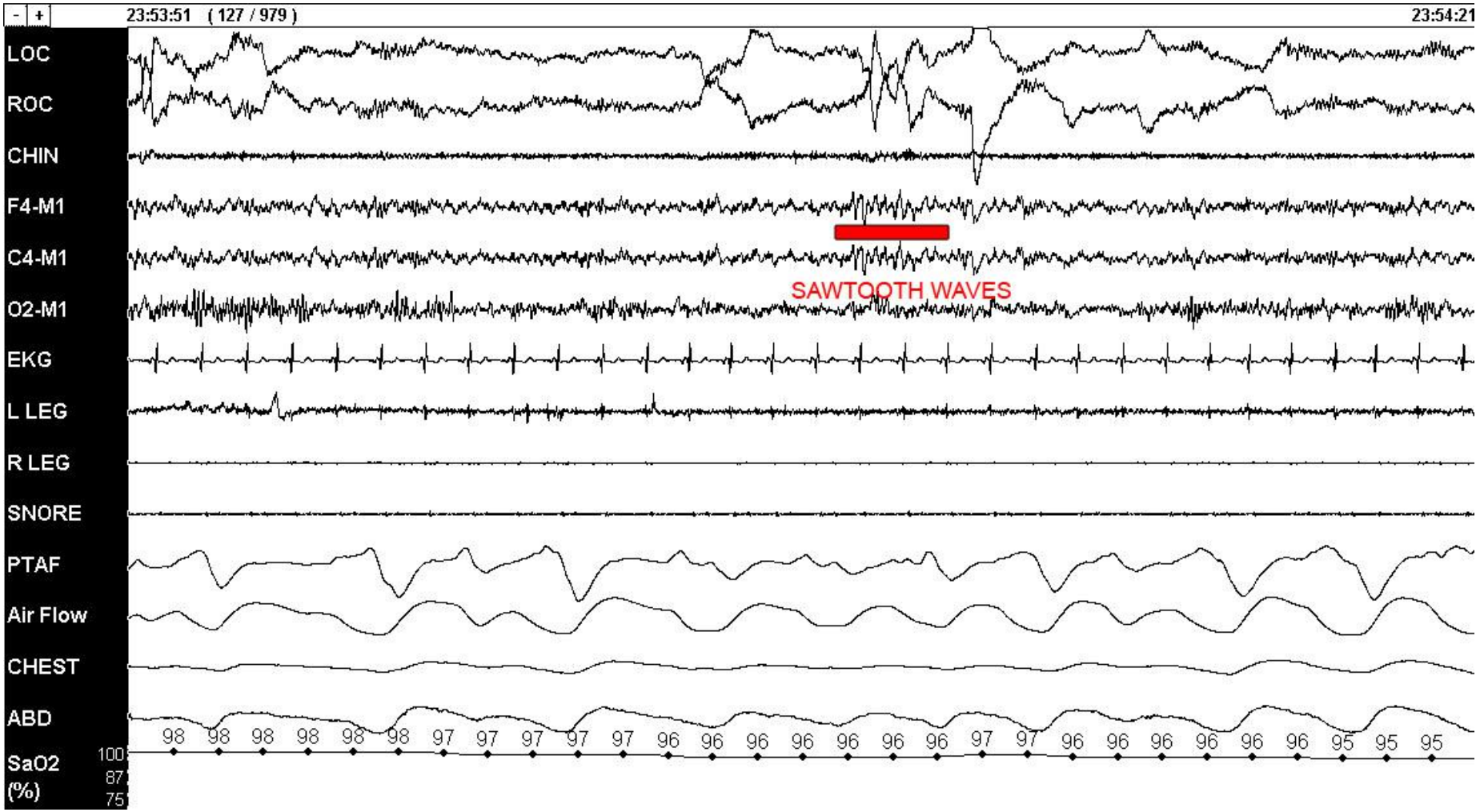
REM

- Waveform = LAMF, sawtooth
- Eyes = REM
- Chin = Lowest

REM


23:51:21 (122 / 979)
23:51:51
LOC
ROC
CHIN
F4-M1
C4-M1
O2-M1
EKG
L LEG
R LEG
SNORE
PTAF
Air Flow
CHEST
ABD
SaO2 (%)
100
87
75
RAPID EYE MOVEMENTS
LOW CHIN EMG TONE
EEG SHOWS RELATIVELY LOW VOLTAGE, MIXED FREQUENCY ACTIVITY
95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95 95

REM


23:53:51 (127 / 979)
23:54:21
LOC
ROC
CHIN
F4-M1
C4-M1
O2-M1
EKG
L LEG
R LEG
SNORE
PTAF
Air Flow
CHEST
ABD
SaO2 (%)
100
87
75
SAWTOOTH WAVES
98 98 98 98 98 98 97 97 97 97 97 96 96 96 96 96 96 96 97 97 96 96 96 96 96 96 95 95 95