

 CHEST®
Congress
2019

Thailand

Bangkok | 10-12 April

Connecting a Global Community
in Clinical Chest Medicine



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PAP Downloads

Nancy Collop, MD

Emory University



Naricha Chirakalwasan, MD Chulalongkorn University



Conflicts of Interest

- Collop
 - Royalties from UPTODATE as an author and editor
 - Received grant monies and was on advisory council for Jazz Pharmaceuticals (2017-2018)
- Chirakalwasan
 - Symposium Honorarium from ResMed, Respironics, Fisher-Paykel
 - Research medical devices from ResMed, Respironics, Fisher-Paykel

RESPIRONICS DOWNLOADS – Pg 1



RESPIRONICS DOWNLOADS – Pg 2

Patterns of Use

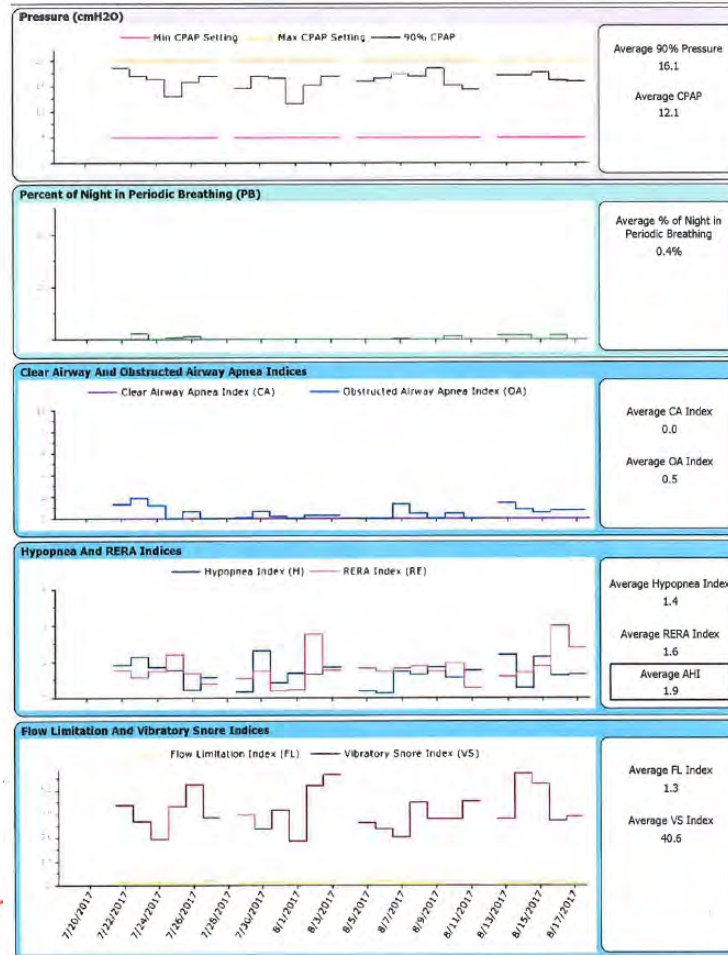


RED Bars = < 4 hrs
Green Bars = > 4 hrs

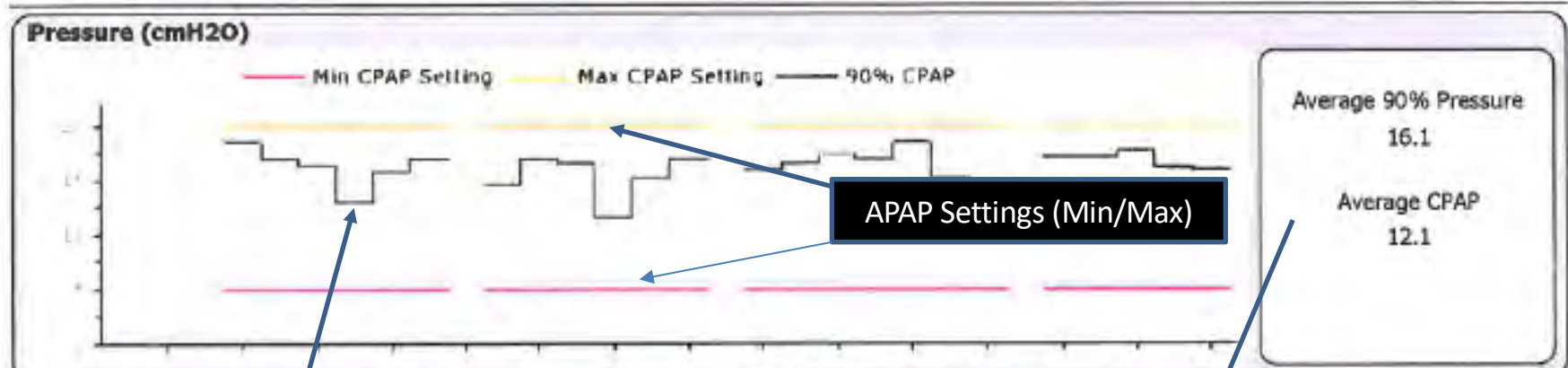
Numerator = hrs @ pressure
Denominator = hours on

Time of Usage

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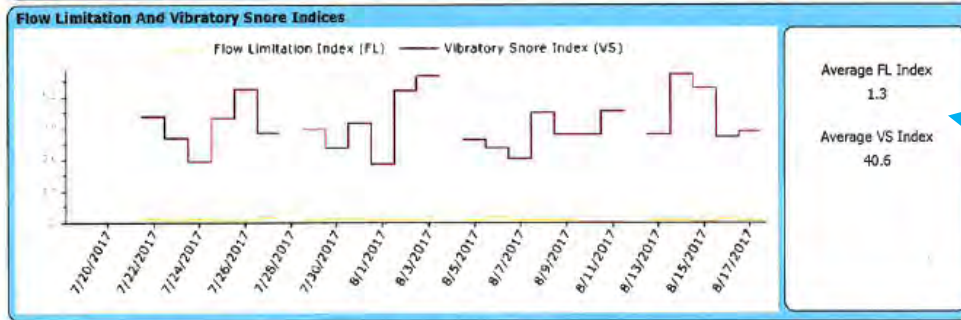
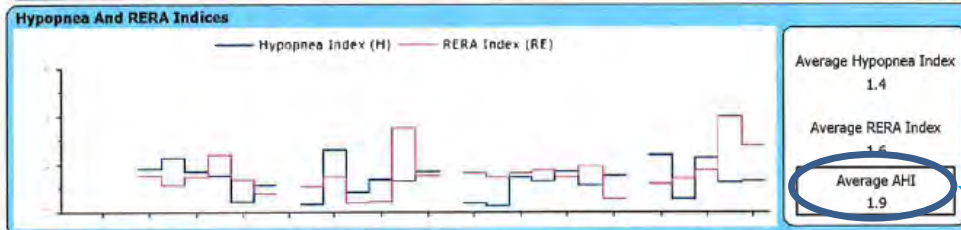
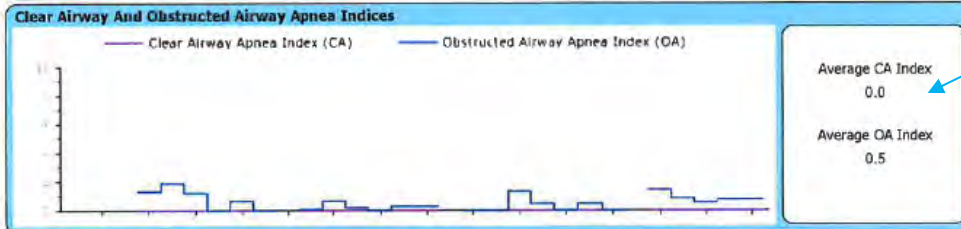
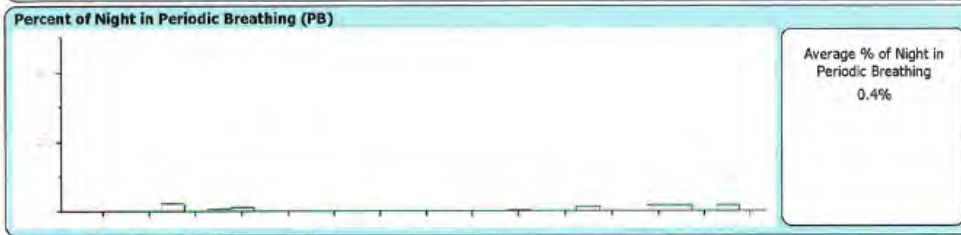


RESPIRONICS DOWNLOADS – Pg 3



90th percentile – at or below pressure the device delivered for 90% of that night

T90% - 90% of time pressure at or below Avg CPAP level – 50% of time above/below



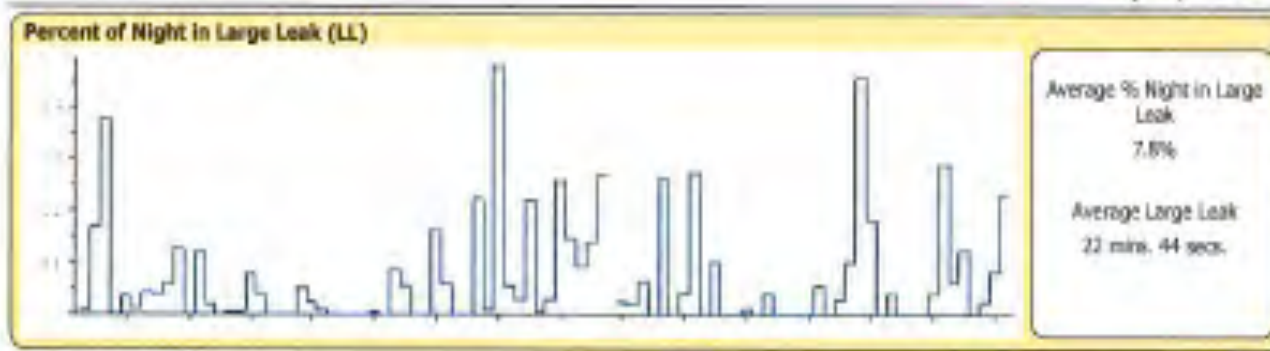
CA = Clear Airway Apnea
OA = Obstructive Apnea

Events tallied by
flow sensor
embedded in circuit

RERA = respiratory effort
related arousal !?!?

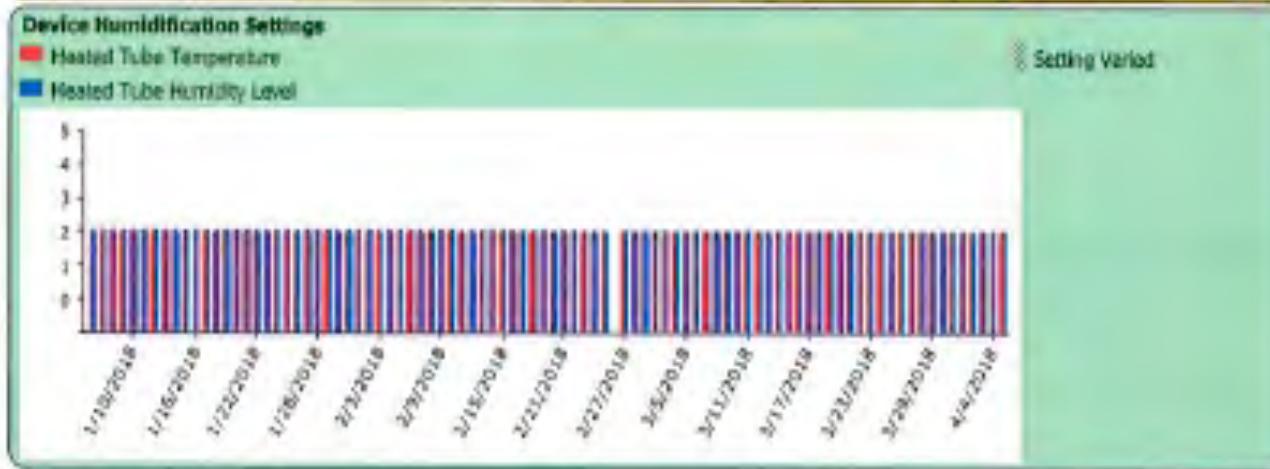
FL = Flow limited
VS = Vibratory Snoring

RESPIRONICS DOWNLOADS – Pg 4



Leak as a % of the night
and total time in lg leak
7.8% (< 10%)

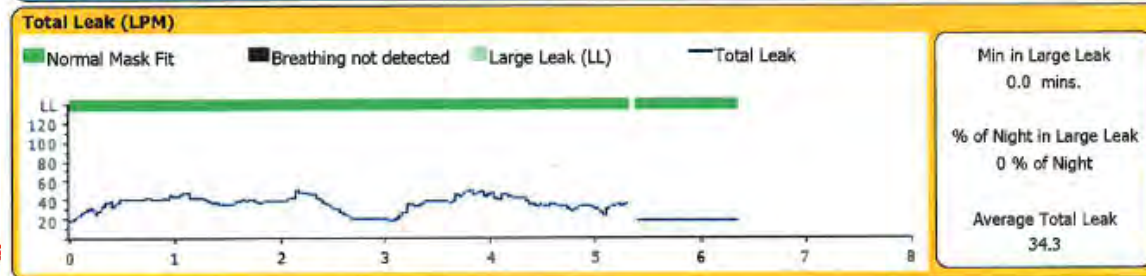
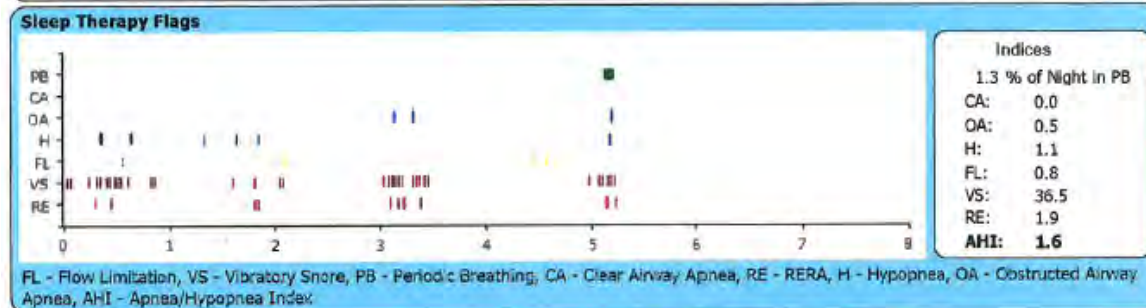
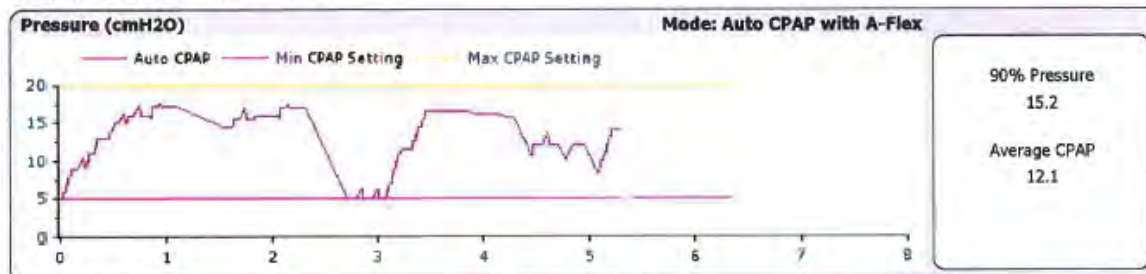
Large Leak = 22 min, 44 sec
Double the total leak
(intentional + unintentional)



A-Flex

Daily Details

8/10/2017 9:42 PM - 8/11/2017 4:02 AM



Compliance Summary	
Date Range	7/19/2017 - 8/17/2017 (30 days)
Days with Device Usage	24 days
Days without Device Usage	6 days
Percent Days with Device Usage	80.0%
Cumulative Usage	5 days 1 hrs. 56 mins. 10 secs.
Maximum Usage (1 Day)	8 hrs. 14 mins. 34 secs.
Average Usage (All Days)	4 hrs. 3 mins. 52 secs.
Average Usage (Days Used)	5 hrs. 4 mins. 50 secs.
Minimum Usage (1 Day)	2 hrs. 10 mins. 13 secs.
Percent of Days with Usage >= 4 Hours	56.7%
Percent of Days with Usage < 4 Hours	43.3%
Total Blower Time	5 days 1 hrs. 56 mins. 17 secs.

Auto CPAP Summary	
Auto CPAP Mean Pressure	12.1 cmH2O
Auto CPAP Peak Average Pressure	15.2 cmH2O
Average Device Pressure <= 90% of Time	16.1 cmH2O
Average Time in Large Leak Per Day	40 secs.
Average AHI	1.9

Device Settings as of 8/17/2017

Device Mode AutoCPAP - A-Flex

Device Settings

Parameter	Value
Min Pressure	5 cmH2O
Max Pressure	20 cmH2O
A-Flex Setting	3
Auto Off	Off
Auto On	On
View Optional Screens	Off
Ramp Type	Off
Mask Resistance	Off
Mask Resistance Lock	Off
Tubing Type	15
Tubing Type Lock	Off
Opti-Start	Off
EZ-Start	Disabled
Tube Temperature	3
Humidifier	Off
Humidification Mode on Heated Tube Disconnect	Adaptive

RESPIRONICS DOWNLOADS – Last Page

Compliance Summary

Date Range	7/19/2017 - 8/17/2017 (30 days)
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Days without Device Usage	6 days
Percent Days with Device Usage	80.0%
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Auto On	On
View Optional Screens	Off
Ramp Type	Off
Mask Resistance	Off
Mask Resistance Lock	Off
Tubing Type	15
Tubing Type Lock	Off
Opti-Start	Off
EZ-Start	Disabled
Tube Temperature	3
Humidifier	Off
Humidification Mode on Heated Tube Disconnect	Adaptive

THERAPY DATA REPORTING

Select data for report

- One week
- One month
- Two months
- Three months
- Six months
- Custom
- Best 30 days of compliance

Refresh graph

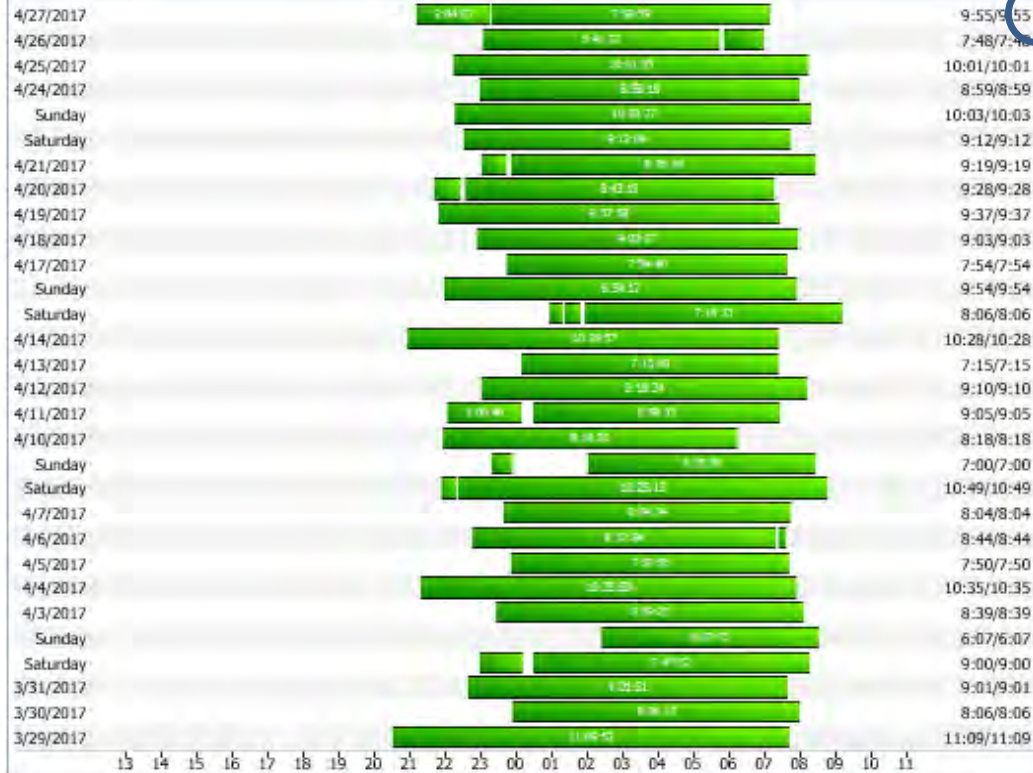
Select report

Details Report

Select number of days for Detail section

7

Create report



9:55/9:55

Sleep Doctor:
Collop, Nancy

Group/Practice:
Phone: 404-728-6925
Fax: 404-712-8145
Email:

iland
| 10-12 April

PCP:
Collop, Nancy

Phone: 404-728-6925

Clinician:
Speed, Tracey

WaveForm Report: 2/24/2016

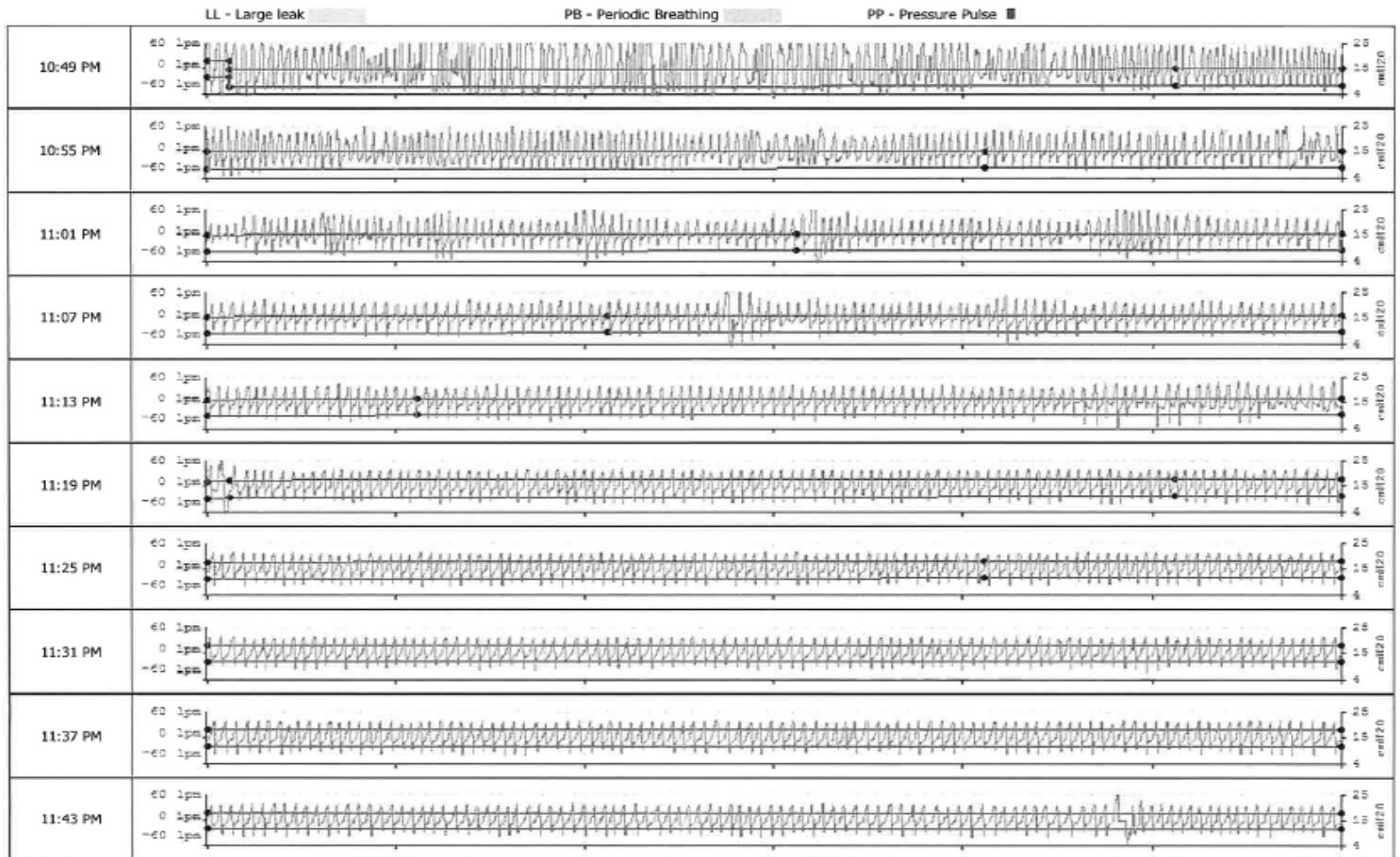
Chart Legend Info:

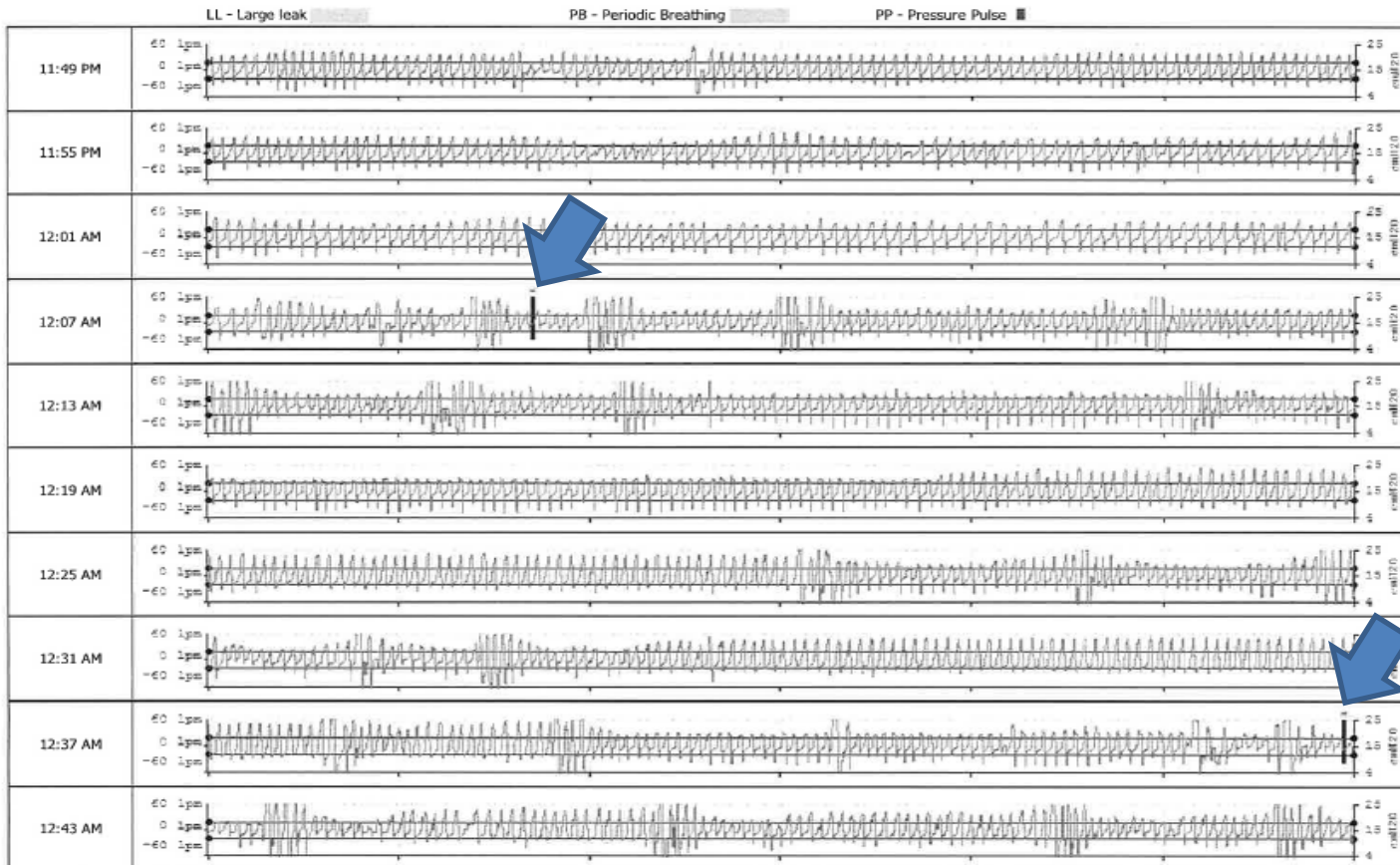
Device S/N: P11899787DD06

— Flow	■ H - Hypopnea
— CPAP	■ FL - Flow Limitation
— IPAP	■ RE - RERA
— EPAP	■ VS - Vibratory Snore
■ PP - Pressure Pulse	■ LL - Large Leak
■ CA - Clear Airway Apnea	■ PB - Periodic Breathing
■ OA - Obstructed Airway Apnea	

The data provided in this report is only one of several elements to consider when evaluating patient compliance with therapy.

This data is not to be used in the diagnosis of a patient's condition.





Resmed Download - Pg. 1

DUPLICATE - UNATHORIZED	
	46/53 days (87%)
>= 4 hours	25 days (47%)
< 4 hours	21 days (40%)
Usage hours	188 hours 15 minutes
Average usage (total days)	3 hours 34 minutes
Average usage (days used)	4 hours 7 minutes
Median usage (days used)	4 hours 6 minutes

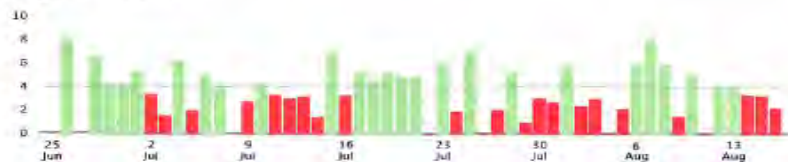
AllSense 10 AutoSet

Serial number	23171362443
Mode	AutoSet
Min Pressure	5 cmH2O
Max Pressure	20 cmH2O
EPR	Fulltime
EPR level	3
Response	Standard

Therapy

Pressure - cmH2O	Median: 7.4	95th percentile: 10.3	Maximum: 11.4
Leaks - L/min	Median: 2.1	95th percentile: 12.9	Maximum: 27.5
Events per hour	AI: 1.0	HI: 0.1	AHI: 1.1
Apnea Index	Central: 0.0	Obstructive: 0.7	Unknown: 0.2
RERA Index			0.1
Cheyne-Stokes respiration (average duration per night)			0 minutes (0%)

Usage - hours



1:26AM

01/11/16, 2017 - 01/16/2017

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46/53 days (87%)

>= 4 hours

25 days (47%)

< 4 hours

21 days (40%)

Usage hours	189 hours 15 minutes
Average usage (total days)	3 hours 34 minutes
Average usage (days used)	4 hours 7 minutes
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AirSense 10 AutoSet

Serial number	
Mode	AutoSet
Min Pressure	5 cmH2O
Max Pressure	20 cmH2O
EPR	Fulltime
EPR level	3
Response	Standard

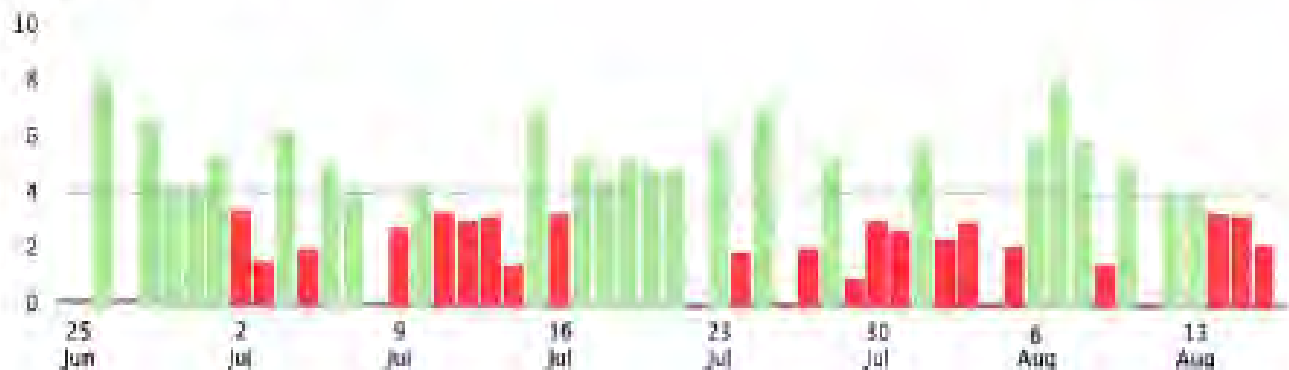
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Therapy

Pressure - cmH ₂ O	Median: 7.4	95th percentile: 10.3	Maximum: 11.4
Leaks - L/min	Median: 2.1	95th percentile: 12.9	Maximum: 27.5
Events per hour	AI: 1.0	HI: 0.1	AHI: 1.1
Apnea Index	Central: 0.0	Obstructive: 0.7	Unknown: 0.2
RERA Index			0.1
Cheyne-Stokes respiration (average duration per night)			0 minutes (0%)

Usage - hours



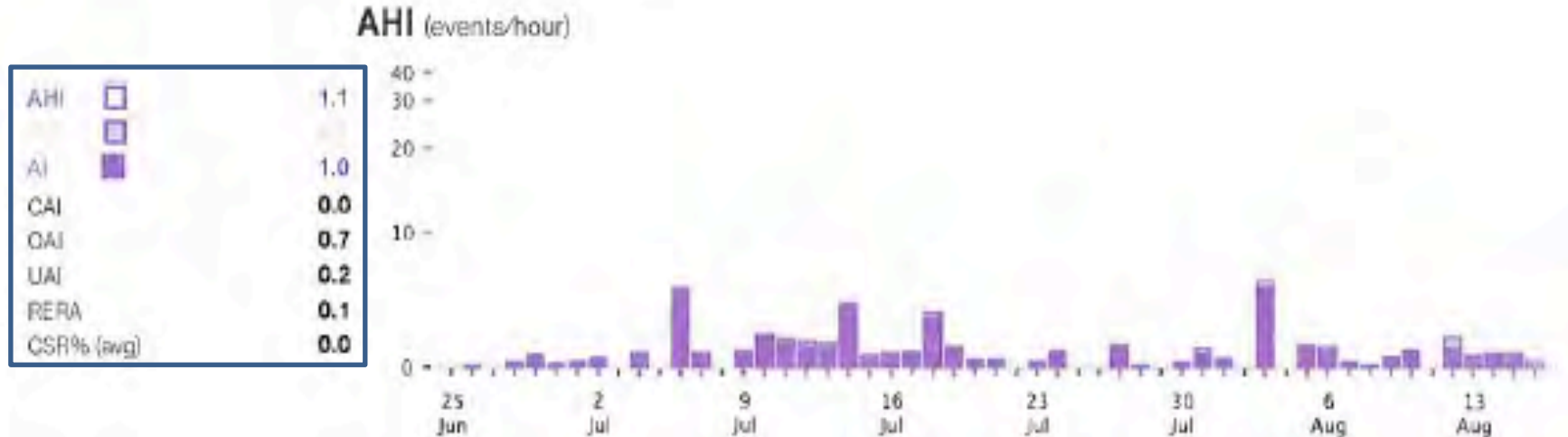
Register now

Resmed Download - Pg 2



Leak:

- absolute value
- unintentional leak only
- 95th percentile

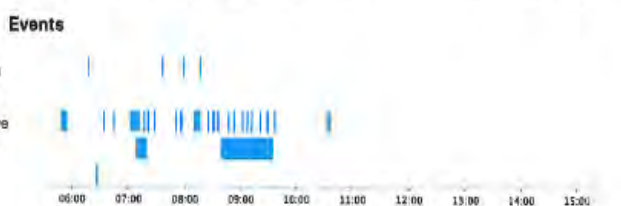
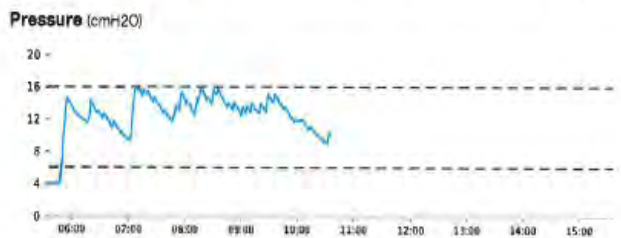
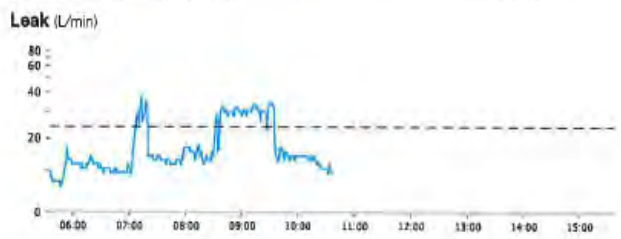


Mode / min - max pressure AutoSet / 6.0 - 16.0 cmH2O
 EPR / level Fulltime / 3.0 cmH2O

Statistics

Usage	5 hr 1 min		
Leak - L/min	Median: 14.4	95th %: 32.4	
Pressure - cmH2O	Median: 13.2	95th %: 15.5	
Events per hour	AHI: 27.7	AI: 26.9	HI: 0.7
	Central: 0.0	Obstructive: 10.5	Unknown: 16.3
			RERA: 0.1

Cheyne-Stokes respiration (duration) 1 hr 8 min (22.6%)



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Chart Patient details Prescription Remote Asset Notes Log Thresholds

Fixed time period 30 days period ending **09/23/2018**



Case #1

- 43 yr old man
- Snoring and apneas per wife
- ESS 15
- Has mild hypertension (untreated), hyperlipidemia and NAFLD
- BMI 28.9
- Underwent HSAT

Sleep Summary

Start Study Time:	12:45:37 AM
End Study Time:	10:16:17 AM
Total Study Time:	9 hrs, 30 min
Sleep Time	9 hrs, 6 min
% REM of Sleep Time:	29.4

Oxygen Saturation Statistics

Mean:	92	Minimum:	63	Maximum:	100
Mean of Desaturations Nadirs (%):					87
Oxygen Desatur. %:	4-9	10-20	>20	Total	
Events Number	285	220	9	514	
Total	55.4	42.8	1.8	100.0	
Oxygen Saturation:	<90	<88	<85	<80	<70
Duration (minutes):	103.1	59.7	27.7	7.1	0.6
Sleep %	18.9	10.9	5.1	1.3	0.1
Pulse Rate Statistics during Sleep (BPM)					
Mean:	74	Minimum:	54	Maximum:	107

Respiratory Indices

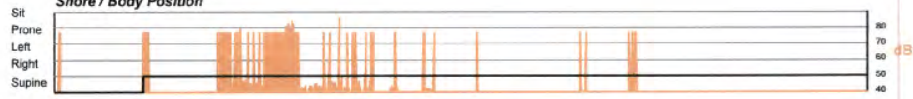
	REM	NREM	All Night
pRDI:	34.4	73.8	62.2
pAHI:	32.9	73.7	61.7
ODI:	32.9	66.3	56.5

Indices are calculated using valid sleep time of 9 hrs, 5 min.
pRDI/pAHI are calculated using oximetry desaturations $\geq 4\%$

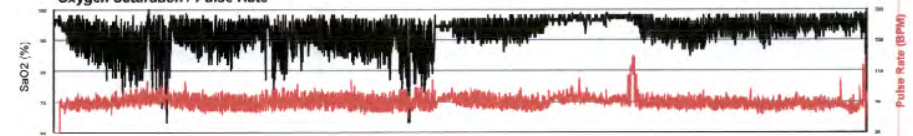
PAT Respiratory Events



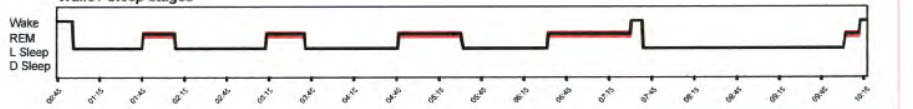
Snore / Body Position



Oxygen Saturation / Pulse Rate



Wake / Sleep stages



WatchPAT study

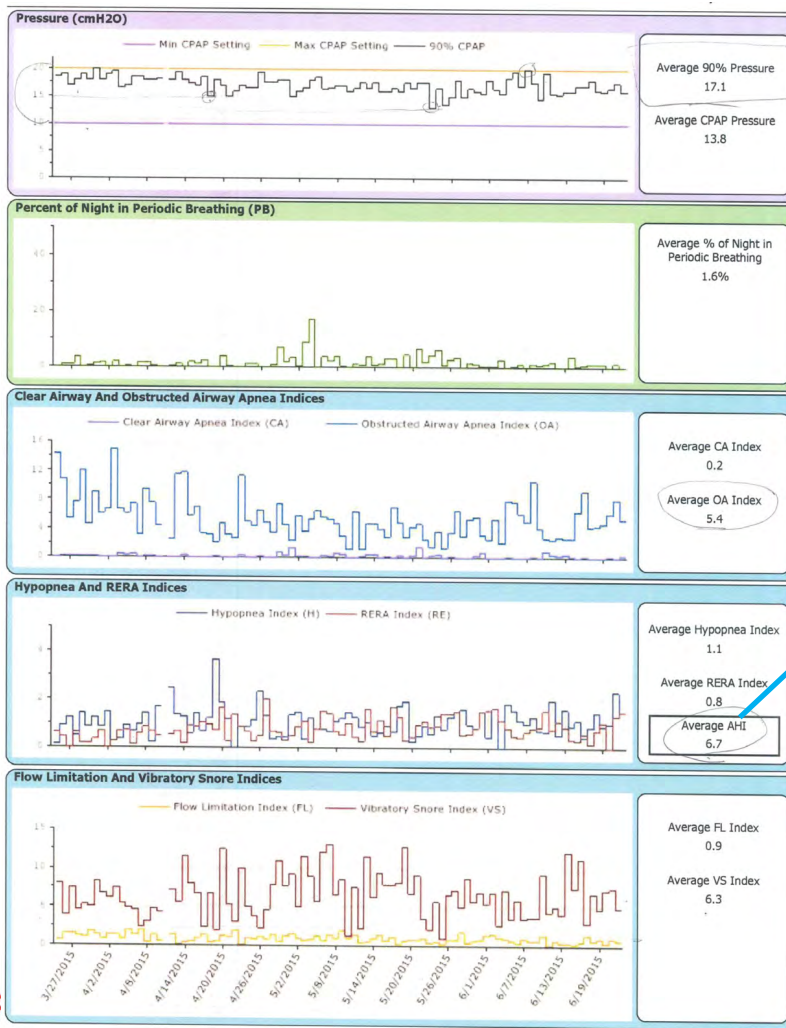
pAHI = 62.2

pRDI = 61.7

SpO₂ nadir = 63%

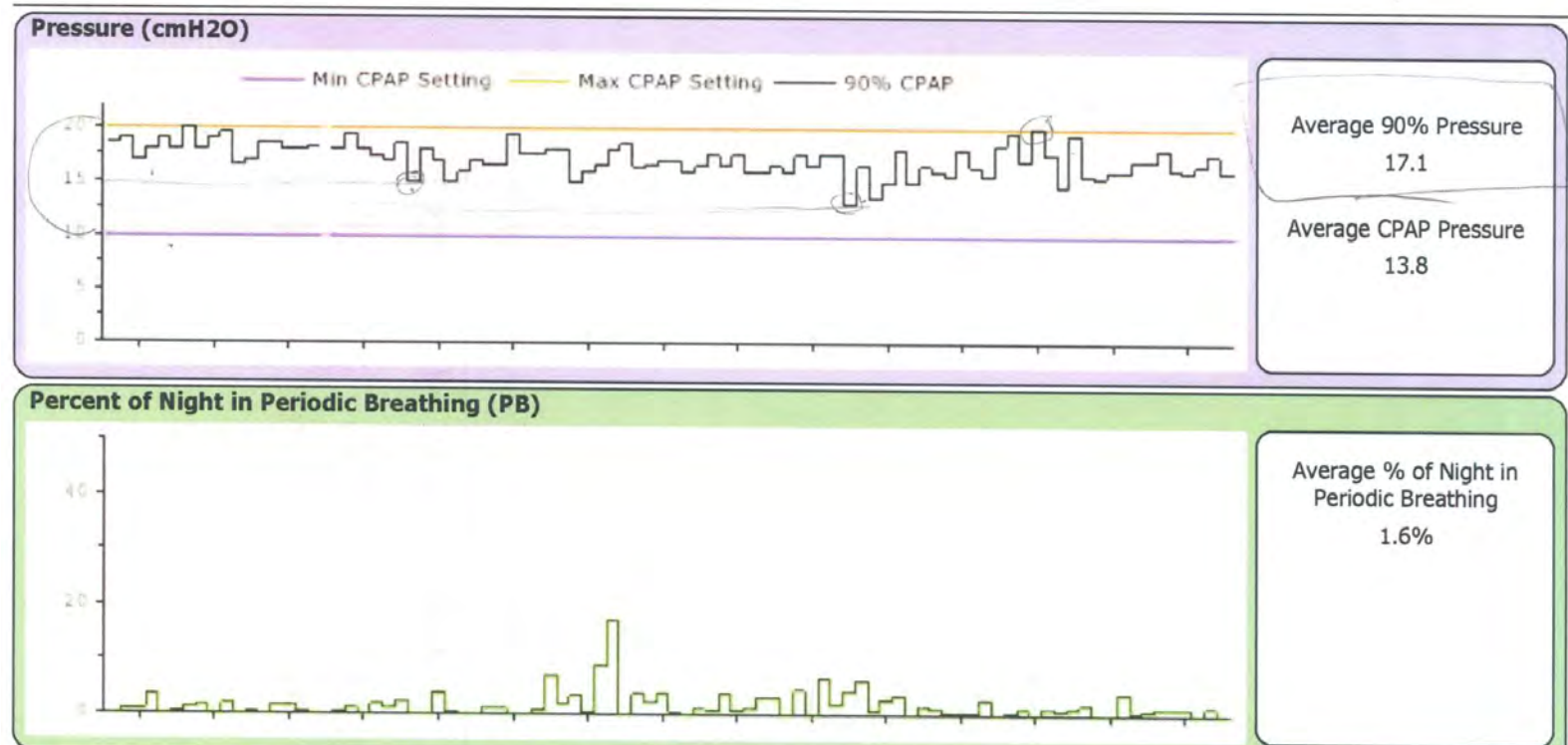
Started on APAP

PAP Download #2

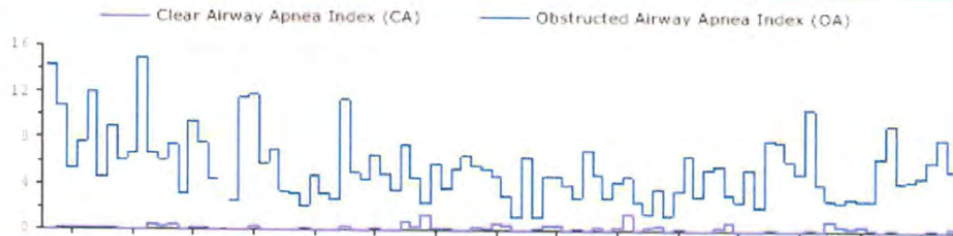


Patient started on autoPAP;
No Large Leak noted

RESIDUAL AHI 6.7



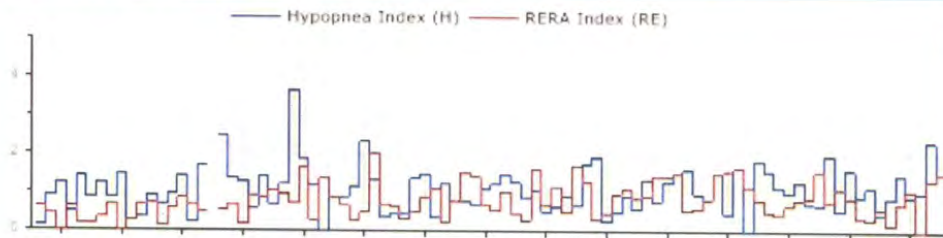
Clear Airway And Obstructed Airway Apnea Indices



Average CA Index
0.2

Average OA Index
5.4

Hypopnea And RERA Indices

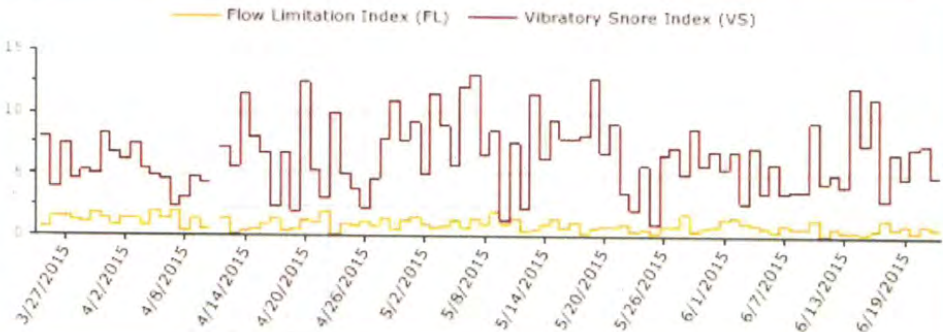


Average Hypopnea Index
1.1

Average RERA Index
0.8

Average AHI
6.7

Flow Limitation And Vibratory Snore Indices



Average FL Index
0.9

Average VS Index
6.3

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What would you do next?

- A. Examine detailed CPAP download data
- B. Put on fixed pressure of 14 cm H₂O (mean)
- C. Put on fixed pressure of 17 (90% tile)
- D. Do formal CPAP titration study
- E. Do ASV titration study

What would you do next?

- A. Examine detailed CPAP download data
- B. Put on fixed pressure of 14 cm H₂O (mean)
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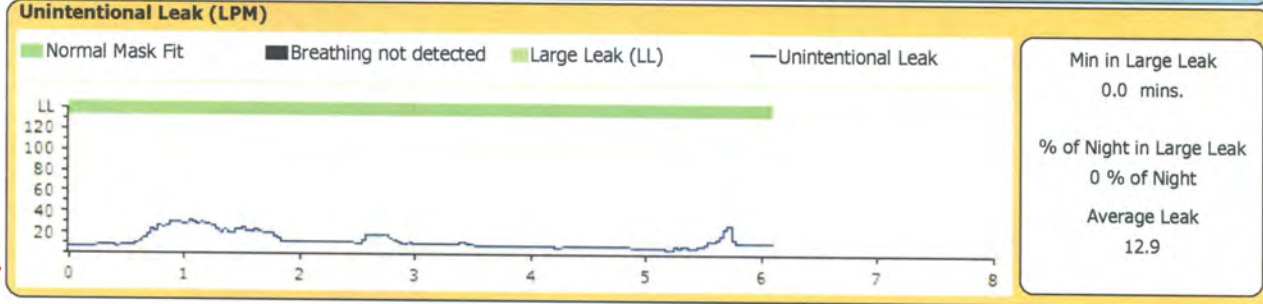
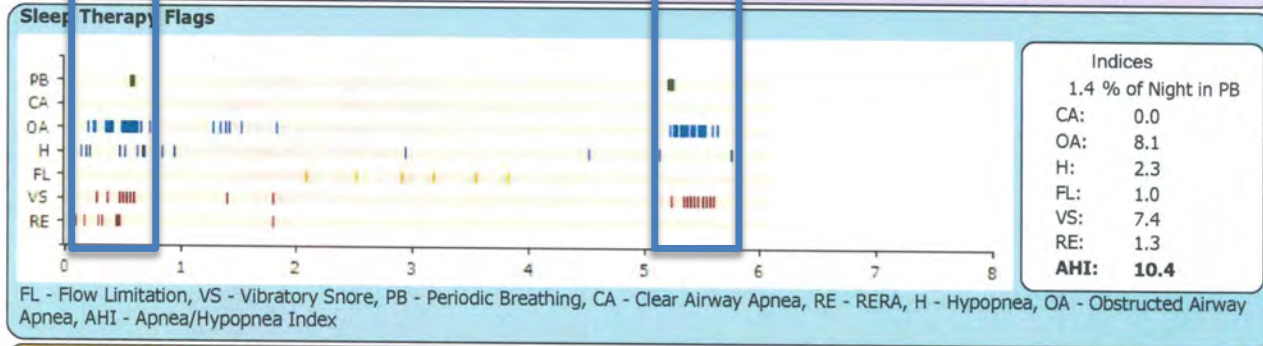
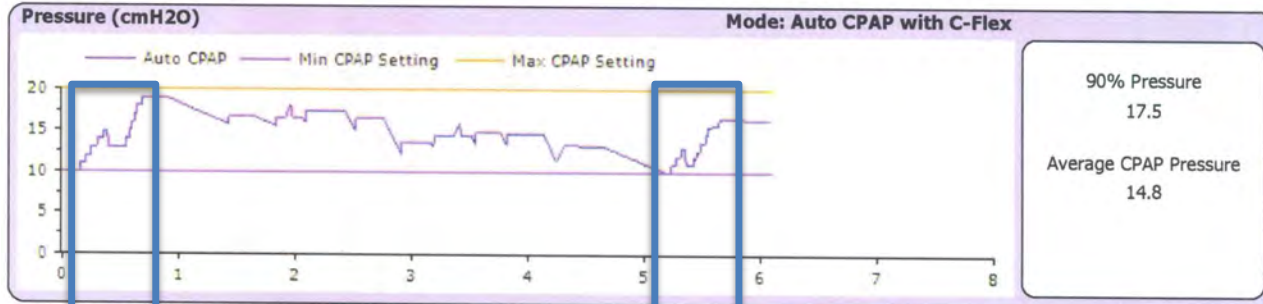
Daily Details

6/21/2015 10:19 PM - 6/22/2015 4:24 AM

C-Flex
by ResMed

Thailand

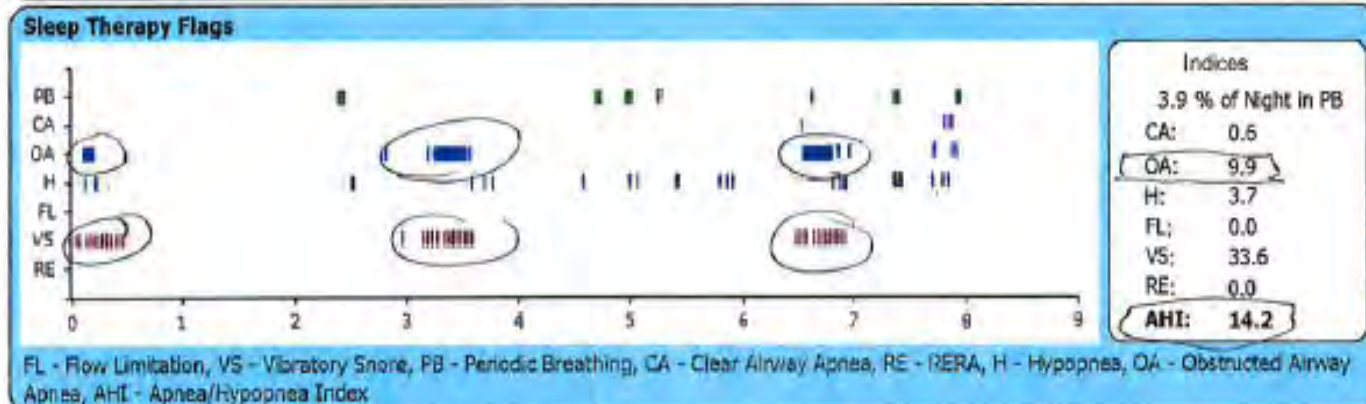
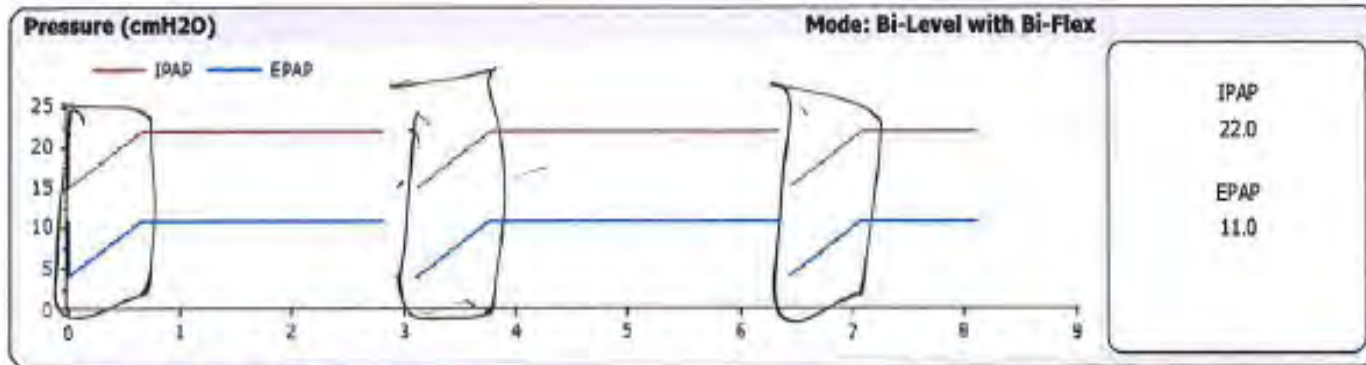
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Another Example with Bilevel PAP



PAP Download #2

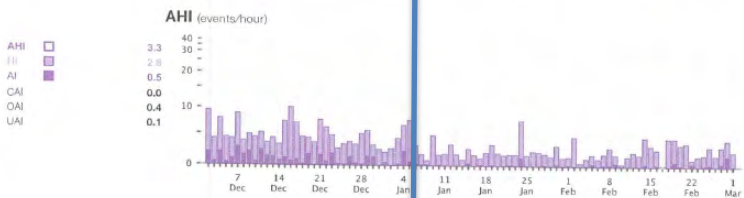
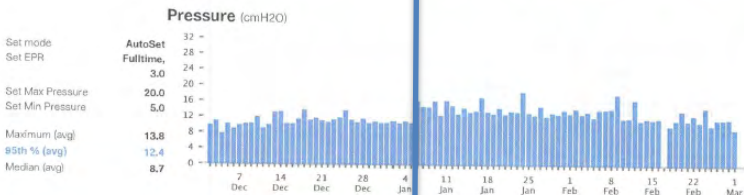
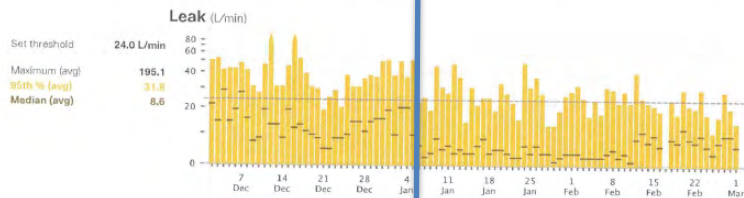
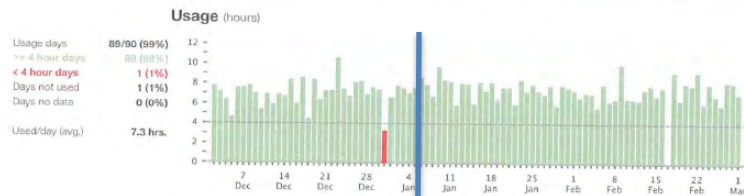
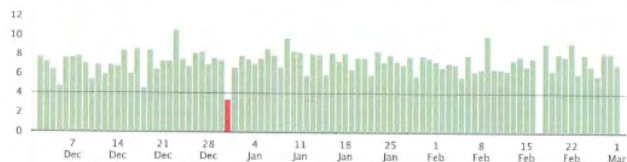
73 yr old man with hypertension, diabetes diagnosed with OSA (AHI 32) and put on autoPAP; first visit on PAP

Usage		12/02/2014 - 03/01/2015
Usage days		89/90 days (99%)
>= 4 hours		88 days (98%)
< 4 hours		1 days (1%)
Usage hours		647 hours 18 minutes
Average usage (total days)		7 hours 12 minutes
Average usage (days used)		7 hours 16 minutes
Median usage (days used)		7 hours 18 minutes

S9 AutoSet	
Serial number	23122161422
Mode	AutoSet
Min Pressure	5 cmH2O
Max Pressure	20 cmH2O
EPR	Fulltime
EPR level	3

Therapy						
Pressure - cmH2O	Median:	8.7	95th percentile:	12.4	Maximum:	13.8
Leaks - L/min	Median:	8.6	95th percentile:	31.8	Maximum:	195.1
Events per hour	AI:	0.5	HI:	2.8	AHI:	3.3
Apnea Index	Central:	0.0	Obstructive:	0.4	Unknown:	0.1

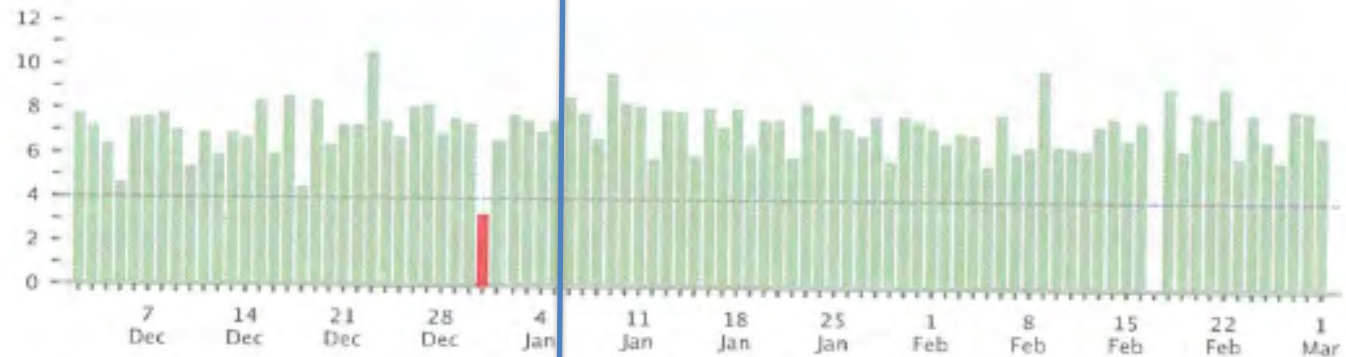
Usage - hours



Usage (hours)

Usage days **89/90 (99%)**
 >= 4 hour days **88 (98%)**
< 4 hour days 1 (1%)
 Days not used **1 (1%)**
 Days no data **0 (0%)**

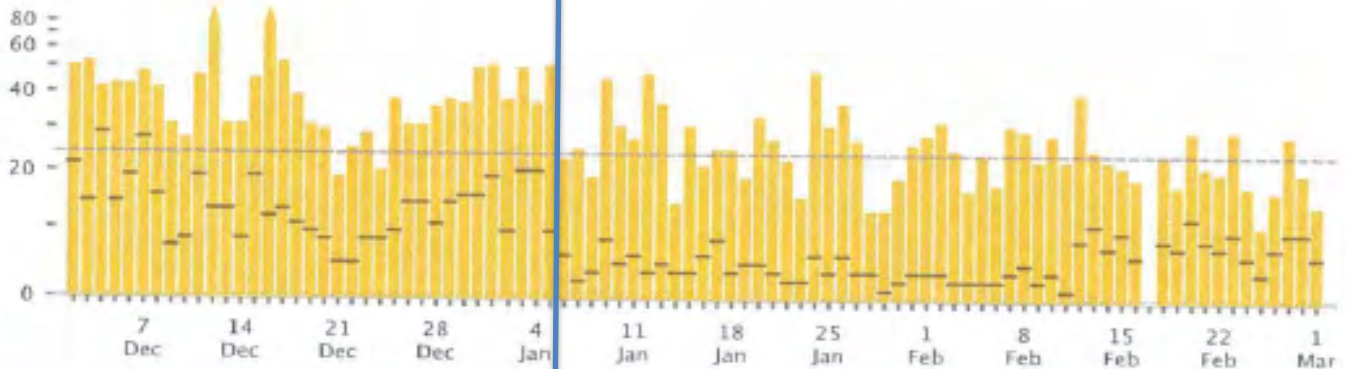
Used/day (avg.) **7.3 hrs.**



Leak (L/min)

Set threshold **24.0 L/min**

Maximum (avg) **195.1**
 95th % (avg) **31.8**
 Median (avg) **8.6**

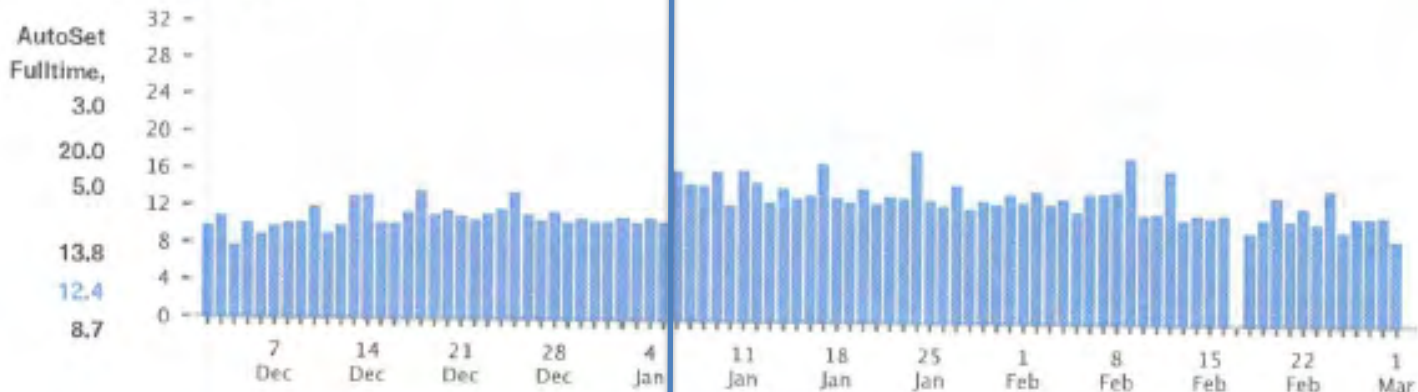


Pressure (cmH2O)

Set mode
Set EPR

Set Max Pressure
Set Min Pressure

Maximum (avg)
95th % (avg)
Median (avg)



AHI (events/hour)

AHI █

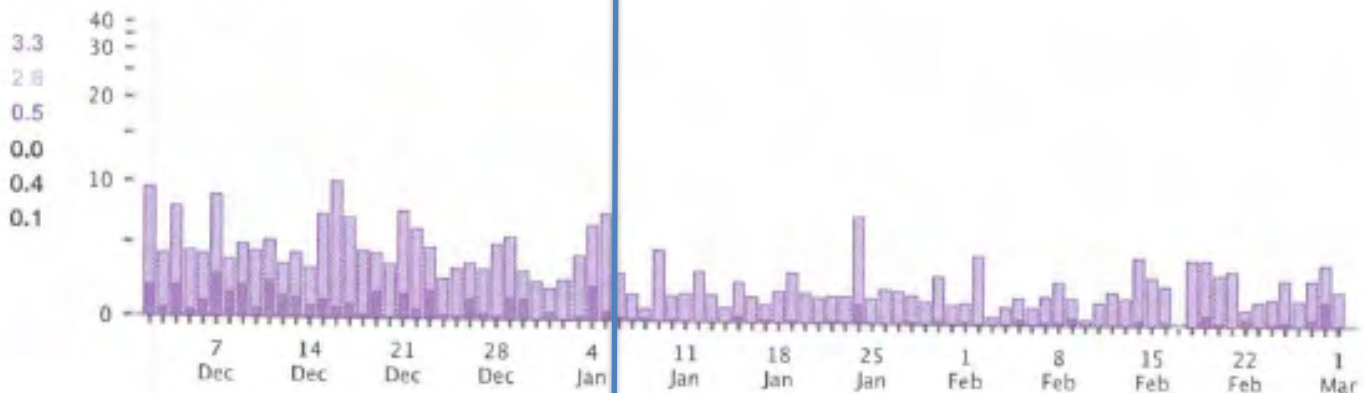
HI █

AI █

CAI

OAI

UAI



What intervention occurred at the time of the vertical line?

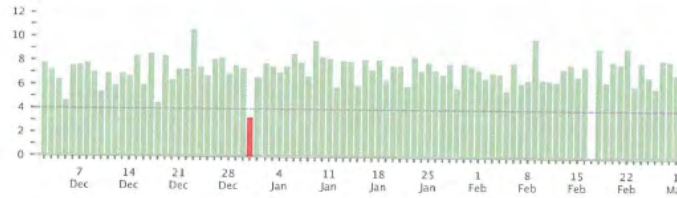
- A. autoPAP pressure levels were manually changed
- B. Patient began sleeping longer
- C. Patient got a new CPAP mask
- D. Patient started drinking a glass of scotch each night following that time
- E. Patient increased the EPR setting on his machine

What intervention occurred at the time of the vertical line?

- A. autoPAP pressure levels were manually changed
- B. Patient began sleeping longer
- C. Patient got a new CPAP mask
- D. Patient started drinking a glass of scotch each night following that time
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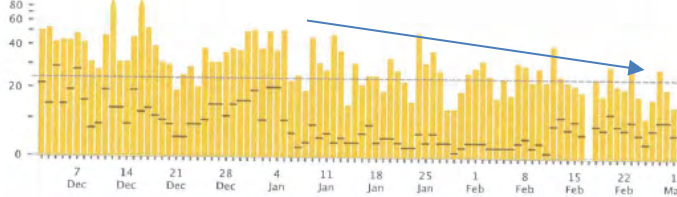
Usage days 89/90 (99%)
 >= 4 hour days 88 (98%)
 < 4 hour days 1 (1%)
 Days not used 1 (1%)
 Days no data 0 (0%)
 Used/day (avg.) 7.3 hrs.

Usage (hours)



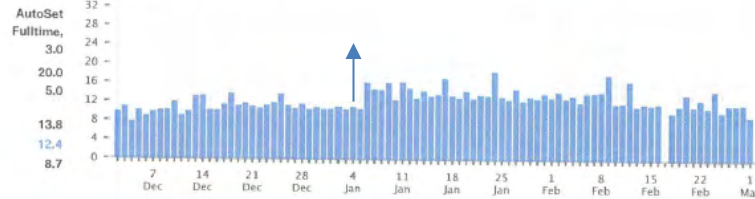
Set threshold 24.0 L/min
 Maximum (avg) 195.1
 95th % (avg) 31.8
 Median (avg) 8.6

Leak (L/min)



Set mode AutoSet
 Set EPR Fulltime, 3.0
 Set Max Pressure 20.0
 Set Min Pressure 5.0
 Maximum (avg) 13.8
 95th % (avg) 12.4
 Median (avg) 8.7

Pressure (cmH2O)



AHI □
 IHI □
 AI □
 CAI □
 OAI □
 UAI □

AHI (events/hour)

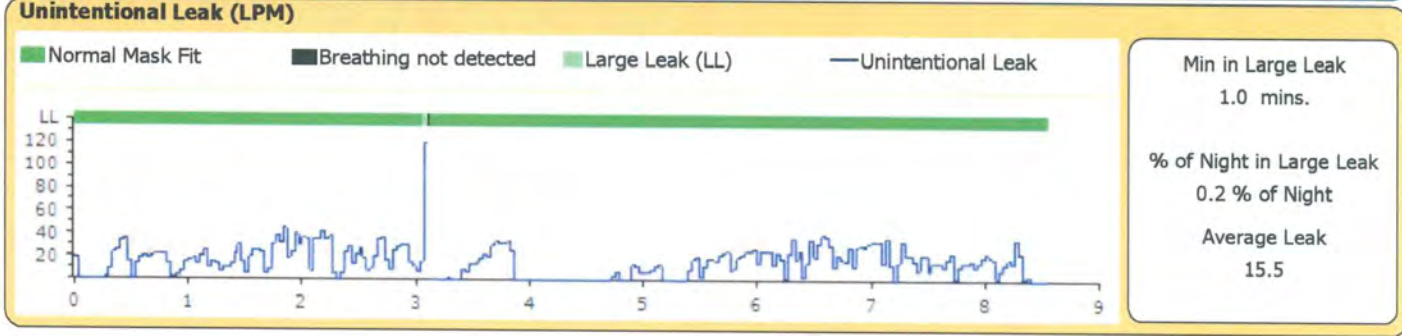
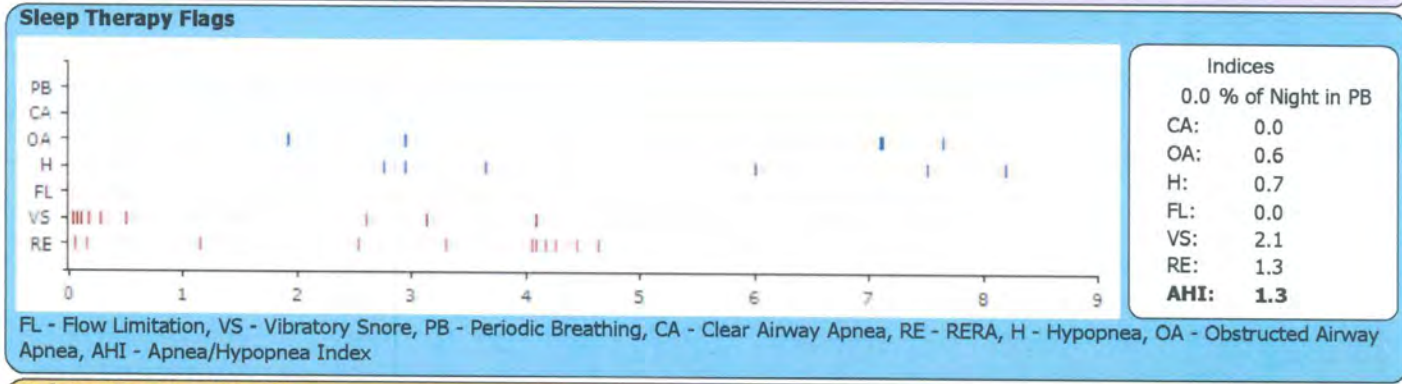
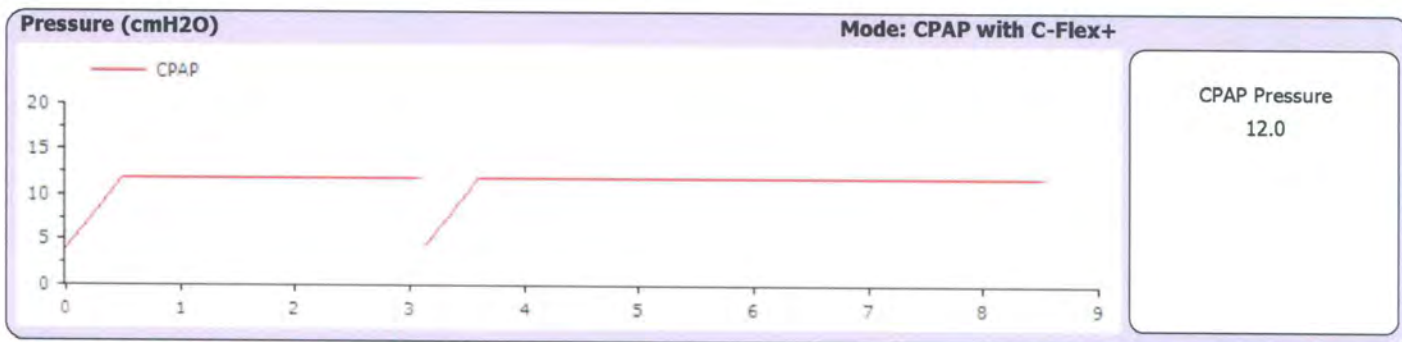


Case #3

- 65 yr old woman with diabetes, chronic kidney disease, hypertension
- Medications: insulin, lisinopril, potassium, furosemide, glyburide
- Diagnosed with OSA (AHI 27) 3 years ago, here for annual CPAP followup visit
- Notes average sleep, some nights worse than others
- Feels like CPAP is working ok
- Download shows low AHI (2.3), no large leak, average use 8 hours, 11 minutes, uses 98% of nights

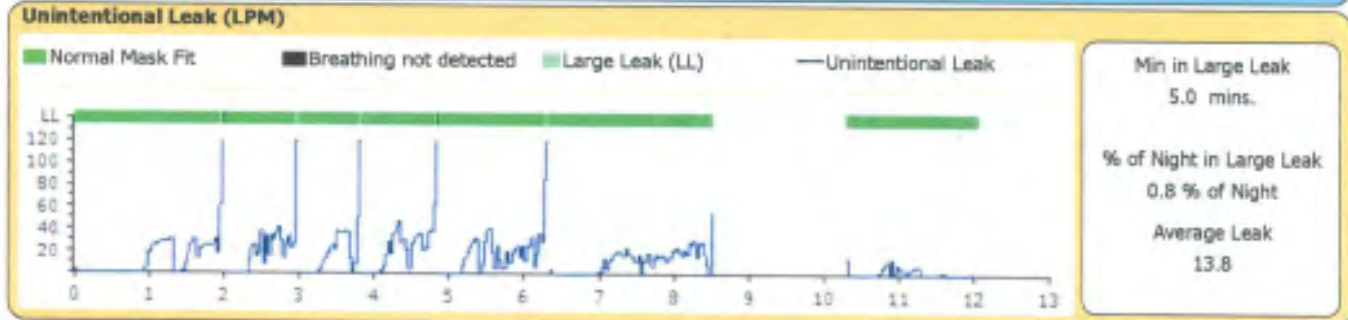
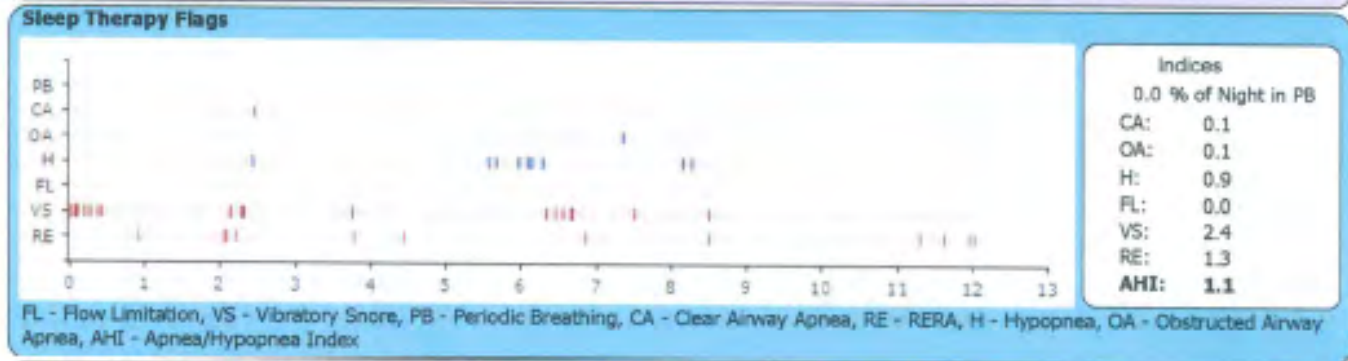
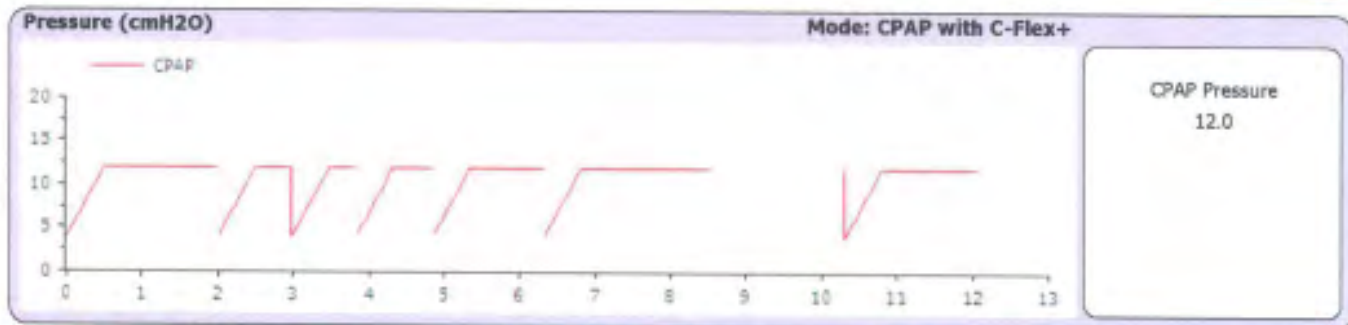
PAP Download #3

Night 1



Register now at

Night 2



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ngkok | 10-12 April

Register now at [c](#)

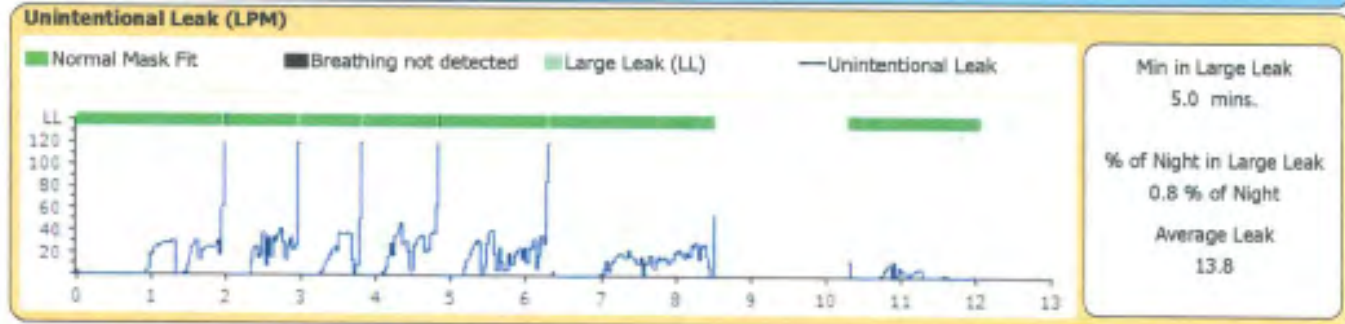
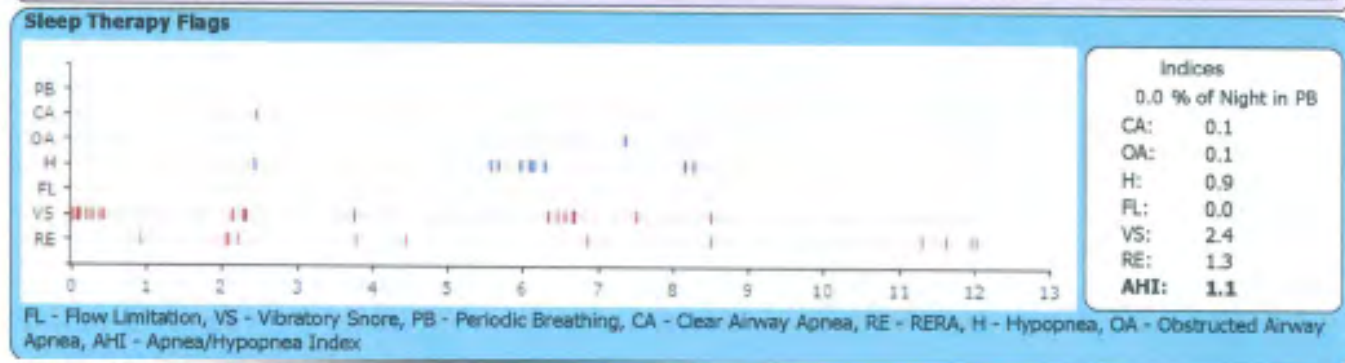
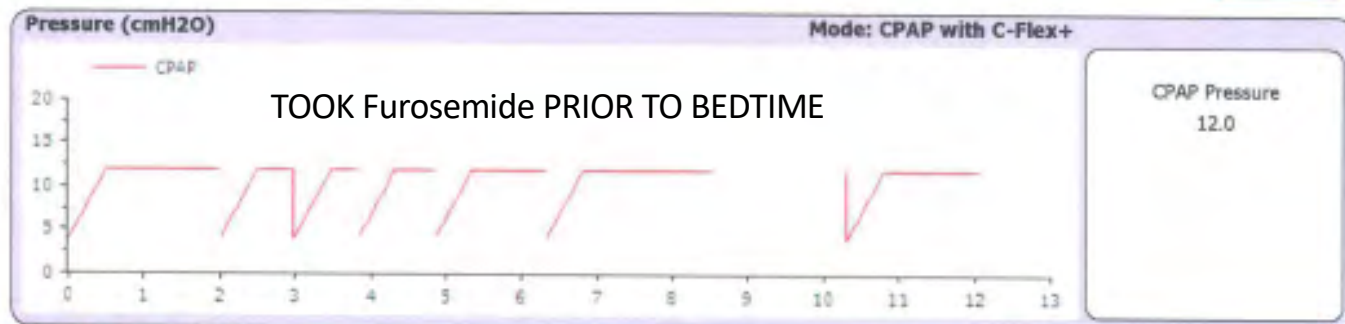
Global Community
Chest Medicine

Why is night 1 so different than night 2?

- A. Drank a bottle of wine before bedtime
- B. Mask leakage awakened patient
- C. Nocturia
- D. Took a pain medication before bed

Why is night 1 so different than night 2?

- A. Drank a bottle of wine before bedtime
- B. Mask leakage awakened patient
- C. Nocturia
- D. Took a pain medication before bed



PAP Download #4



November, 2016

December, 2016



What caused changes seen in CPAP usage?

- A. Patient made changes to his CPAP machine
- B. Patient travelled to US west coast from US east coast
- C. Patient travelled from US east coast to Europe
- D. Patient travelled from US east coast to Asia

November, 2016

December, 2016



What caused changes seen in CPAP usage?

- A. Patient made changes to his CPAP machine
- B. Patient travelled to US west coast from US east coast
- C. Patient travelled from US east coast to Europe
- D. Patient travelled from US east coast to Asia

November, 2016



December, 2016



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Congress | Bangkok, April 10-12, 2017



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in Clinical Chest Medicine

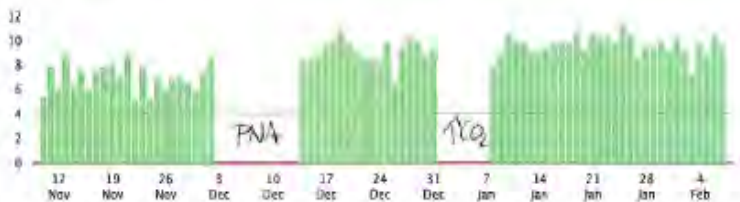
PAP Download #5

Usage	
Usage days	72/90 days (80%)
>= 4 hours	72 days (90%)
< 4 hours	0 days (0%)
Usage hours	
Average usage (total days)	6 hours 55 minutes
Average usage (days used)	8 hours 39 minutes
Median usage (days used)	8 hours 57 minutes
Total used hours (value since last reset)	948 hours

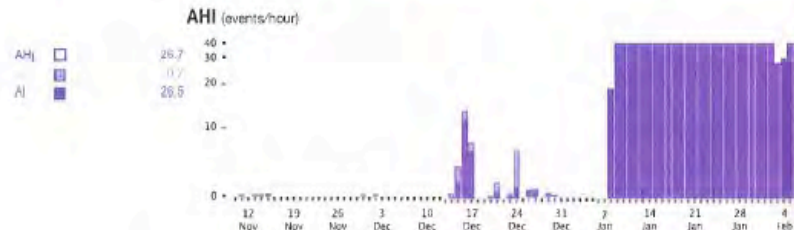
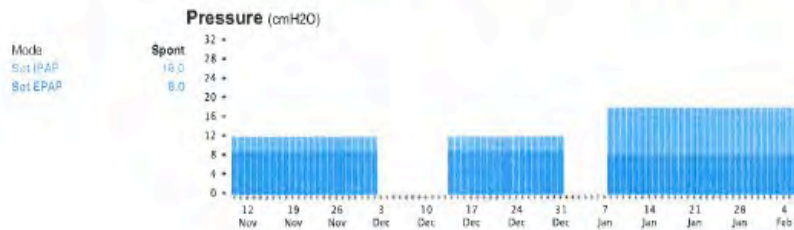
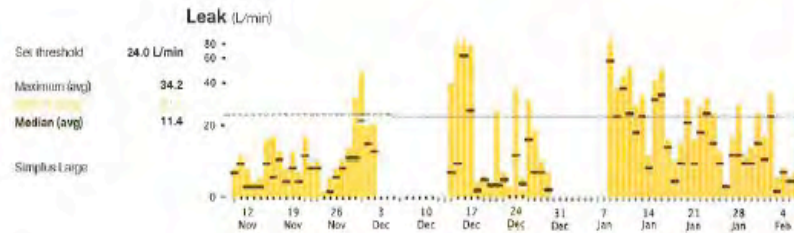
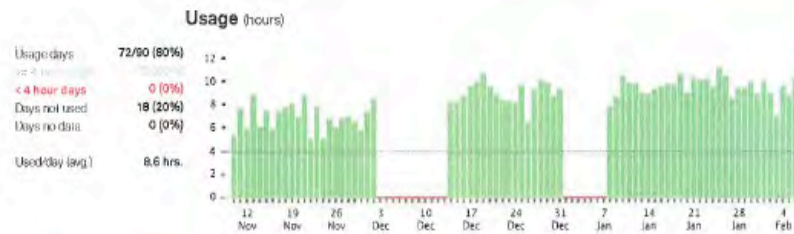
AirCurve 10 VAuto	
Serial number	23171565910
Mode	Spont
IPAP	18 cmH2O
EPAP	8 cmH2O
Easy-Breathe	On

Therapy			
Leaks - L/min	Median: 11.4	95th percentile: 21.5	Maximum: 34.2
Events per hour	AI: 26.5	HI: 0.2	AHI: 26.7

Usage - hours

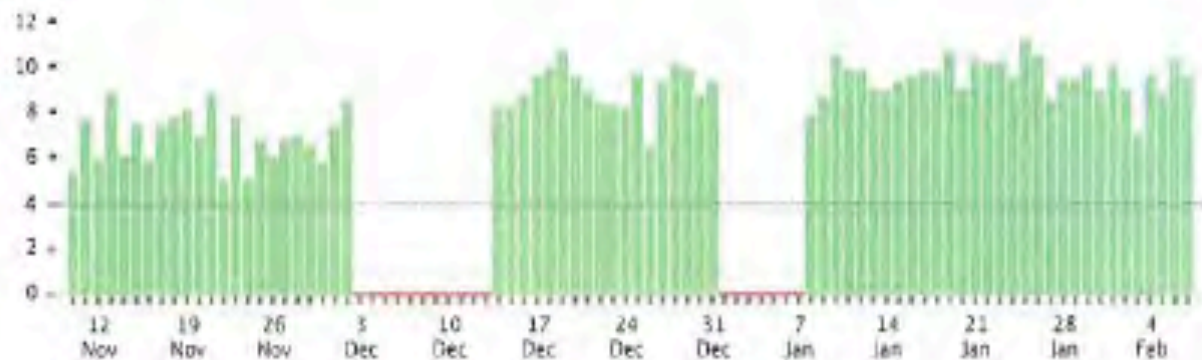


- 27 yo with neurofibromatosis s/p multiple spinal cord tumor resections
- Paralyzed hemidiaphragm on bPAP since age 14
- Hospitalized with PNA
- DC'd and rehospitalized with Hypercapnic RF
- At DC, bPAP increased from 12/8 to 18/8



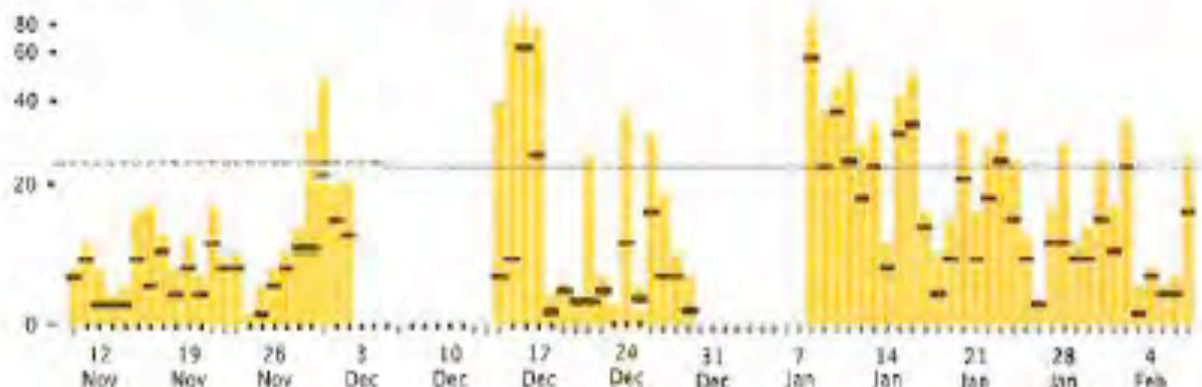
Usage (hours)

Usage days
72/90 (80%)
vs 21 hr
< 4 hour days
0 (0%)
Days not used
18 (20%)
Days no data
0 (0%)
Used/day (avg.)
8,6 hrs.



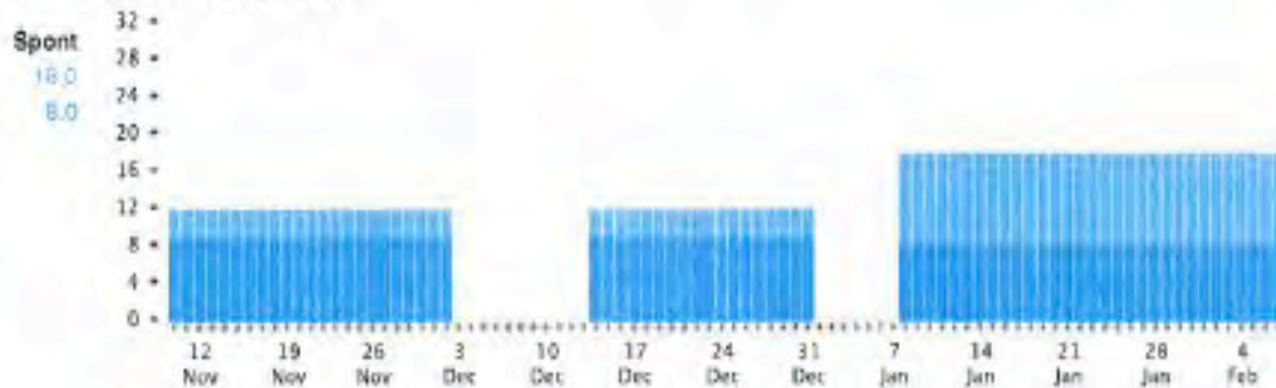
Leak (L/min)

Set threshold
24.0 L/min
Maximum (avg)
34.2
Median (avg)
11.4
Simplus Large



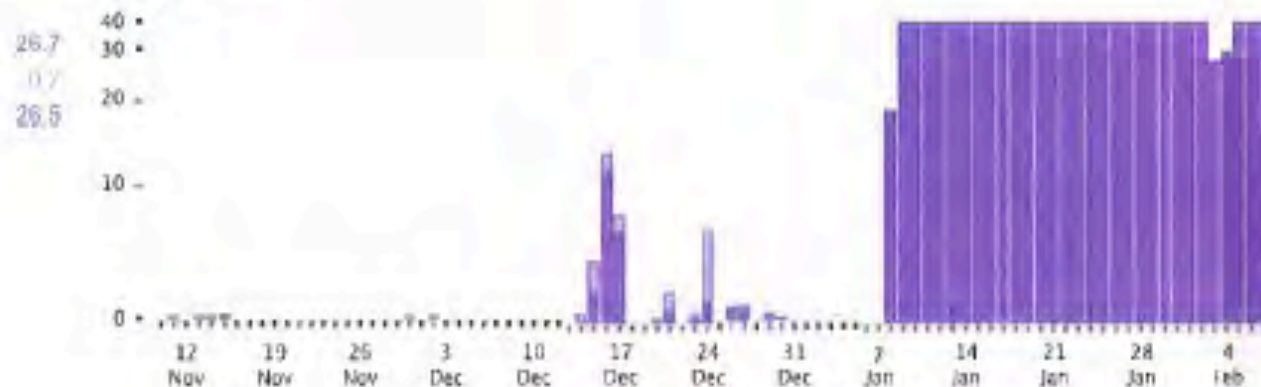
Pressure (cmH₂O)

Mode
Spont
Set IPAP
Set EPAP



AHI (events/hour)

AHj
AI

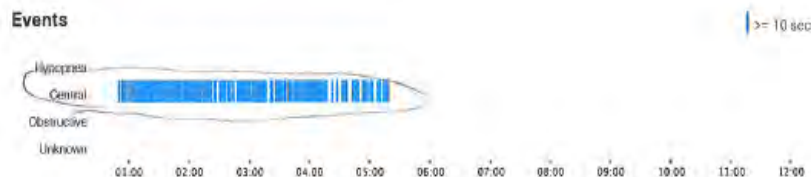
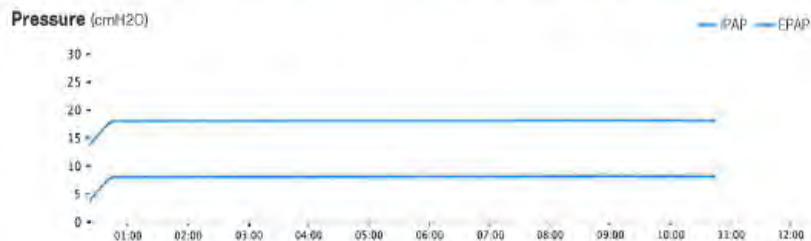
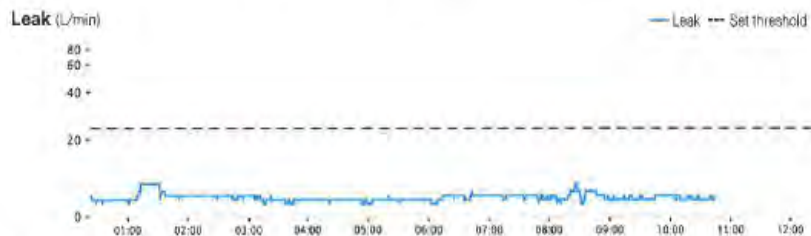


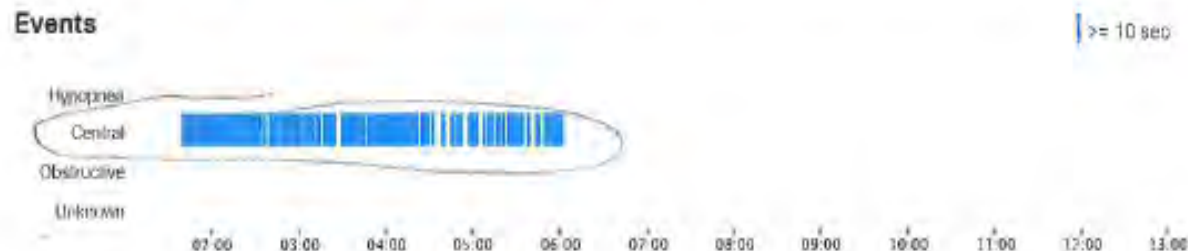
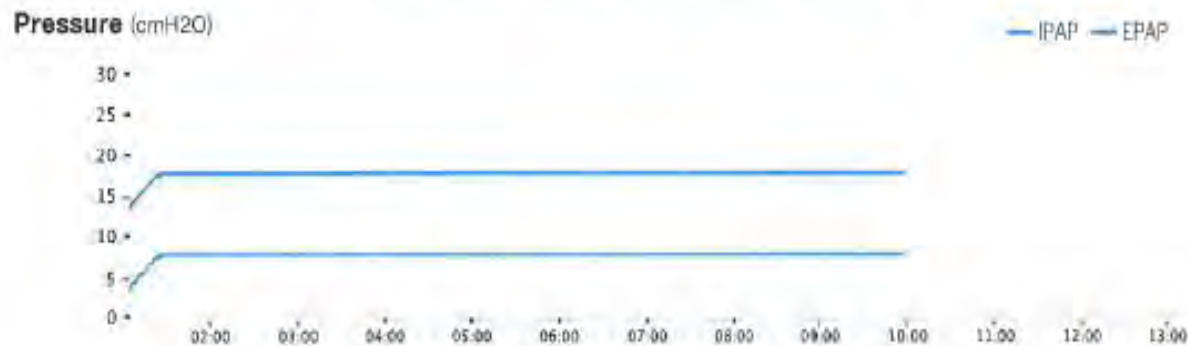
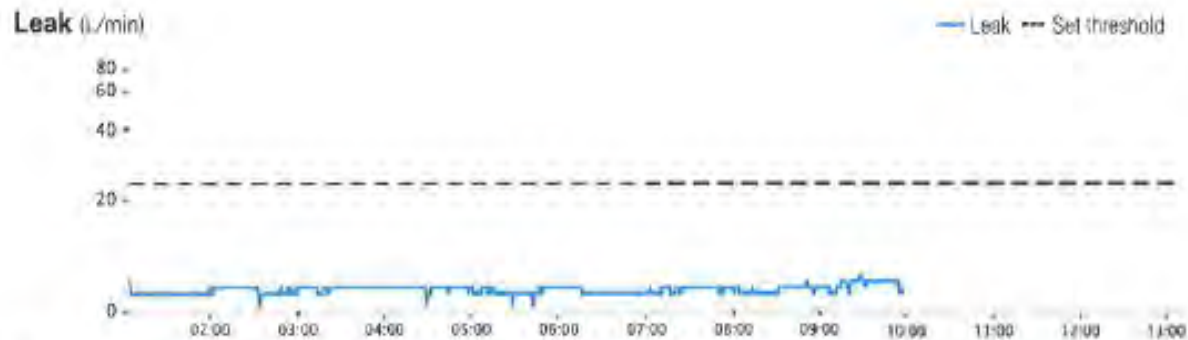
AirCurve 10 VAuto with Simplus Large

Serial number	23171565910
Mode	Spont
EPAP / IPAP	8.0 / 18.0 cmH2O
Easy-Breathe	On

Statistics

Usage			10 hr 27 min
Leak - L/min		Median: 3.6	95th %: 6.0
Events per hour	AHI: 50.3	AI: 50.3	HI: 0.0



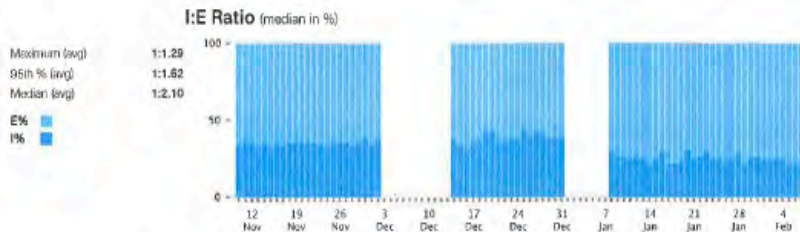
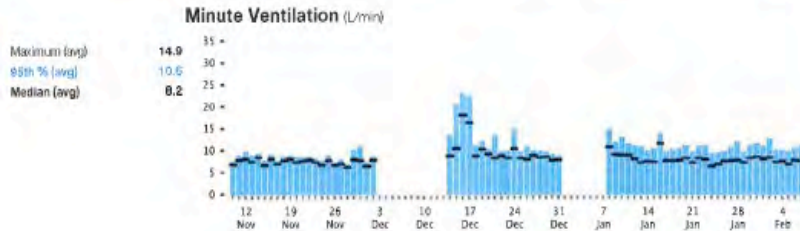
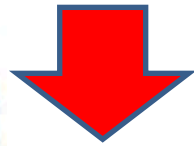
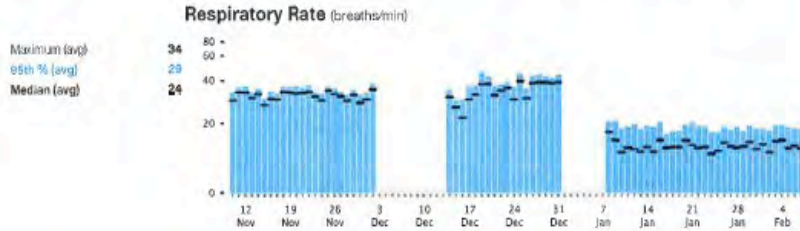
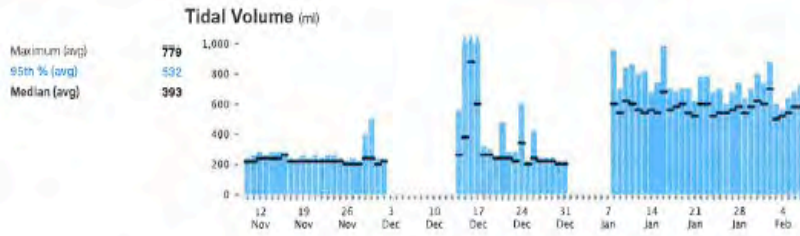


What is likely cause of increase in AHI_{flow} ?

- A. Hypocapnia
- B. Inadequate pressure to maintain airway
- C. Inadequate PAP sensing
- D. Patient started on opioid in the hospital

What is likely cause of increase in AHI_{flow} ?

- A. Hypocapnia
- B. Inadequate pressure to maintain airway
- C. Inadequate PAP sensing
- D. Patient started on opioid in the hospital



Register now at [congress](https://congress.chest.org).

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Usage 03/10/2018 - 04/08/2018

Usage days	30/30 days (100%)
>= 4 hours	30 days (100%)
< 4 hours	0 days (0%)

Usage hours	220 hours 21 minutes
Average usage (total days)	7 hours 21 minutes
Average usage (days used)	7 hours 21 minutes
Median usage (days used)	7 hours 27 minutes
Total used hours (value since last reset)	1,391 hours

AirCurve 10 VAuto

Serial number	23171565810
Mode	Sport
IPAP	14 cmH2O
EPAP	8 cmH2O
Easy-Breathe	On

Therapy

Leaks - L/min	Median: 7.7	95th percentile: 15.3	Maximum: 36.0
Events per hour	Ap: 3.0	HI: 0.1	AHI: 3.1

Usage - hours



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Bangkok | 10-12 April

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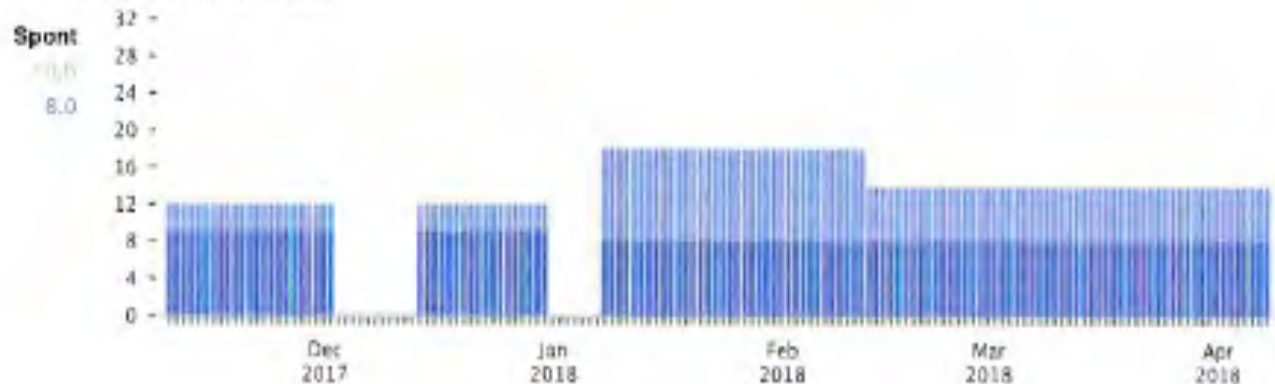
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Pressure (cmH₂O)

Mode

Spont

Set EPAP

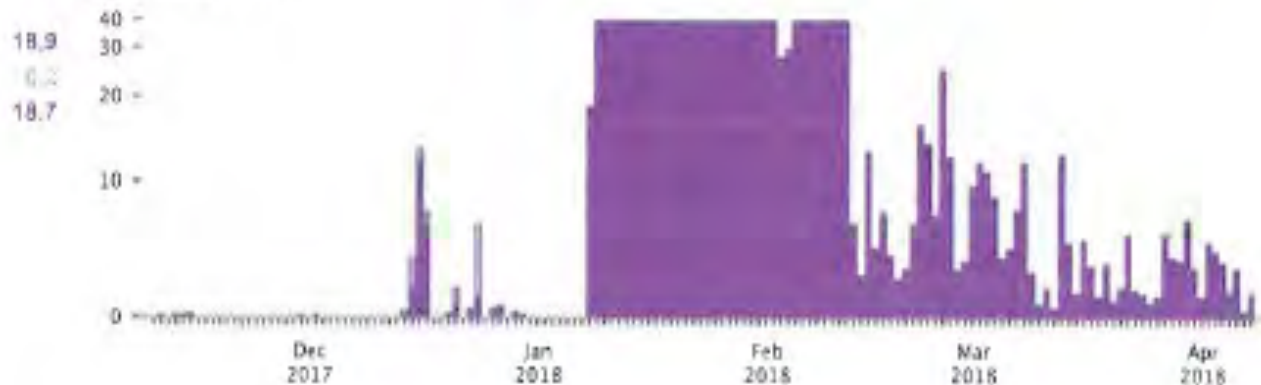


AHI (events/hour)

AHI

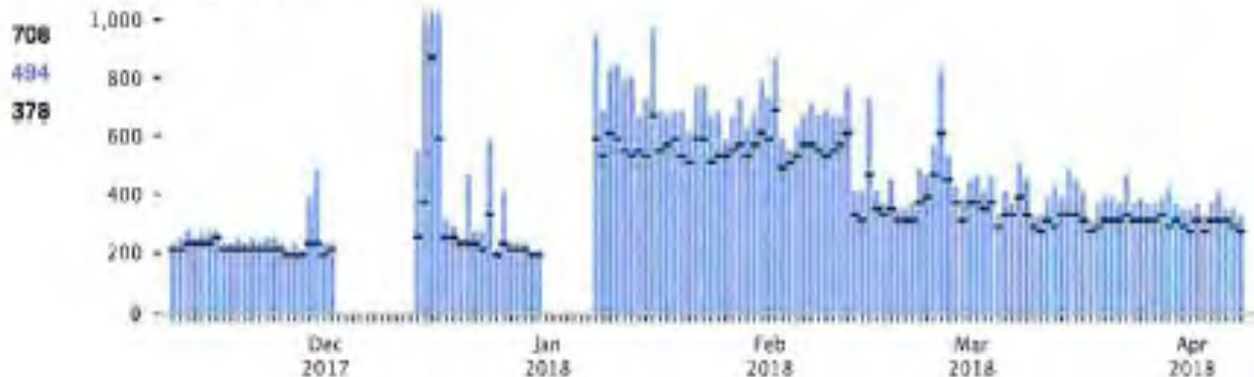
HI

AI



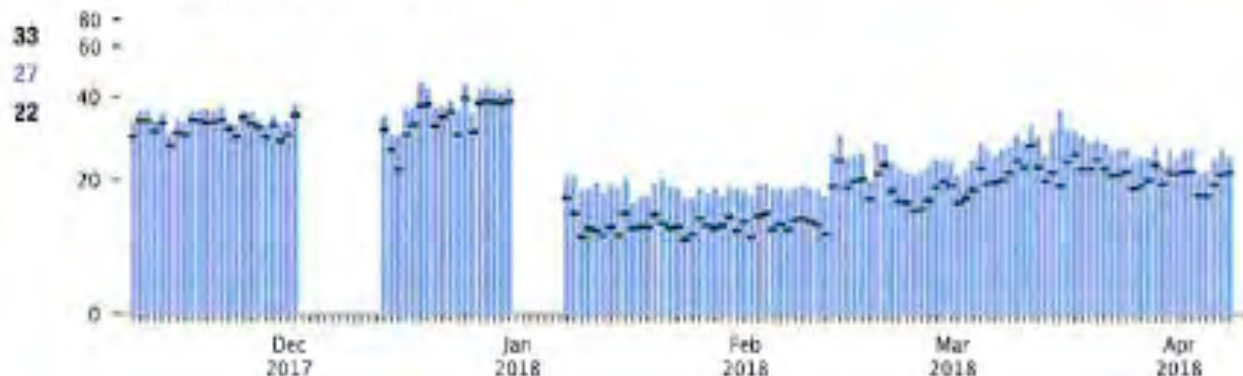
Tidal Volume (ml)

Maximum (avg)
95th % (avg)
Median (avg)



Respiratory Rate (breaths/min)

Maximum (avg)
95th % (avg)
Median (avg)



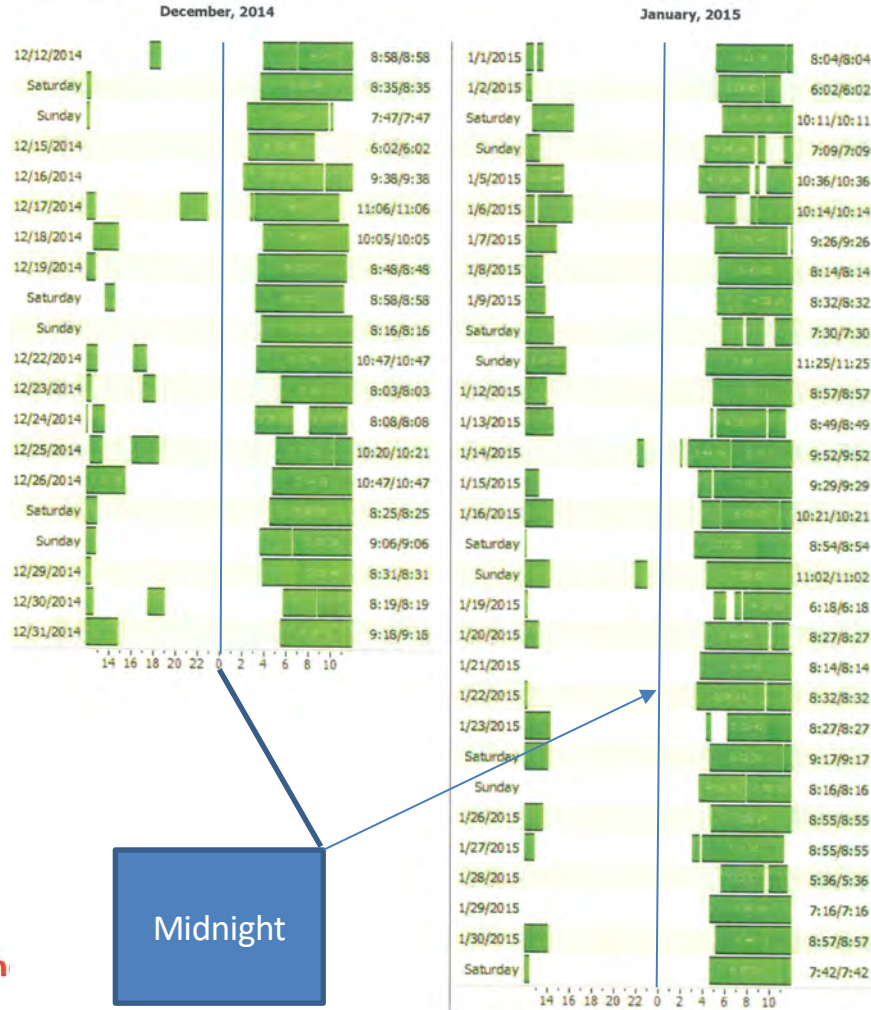
PAP Download #6-8

Mother of a 13 month old
BMI 45, AHI 12
CPAP at 8; residual AHI 1.2



Mother of a 13 month old
 BMI 45, AHI 12
 CPAP at 8; residual AHI 1.2

Patterns of Use



Midnight

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 Bangkok | 10-12 April

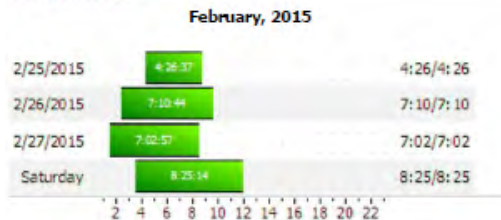
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Connecting a Global Community
 in Clinical Chest Medicine

Father of same 13 month old
BMI 47, AHI 41
CPAP at 13; residual AHI 3.5



Patterns of Use



Noon



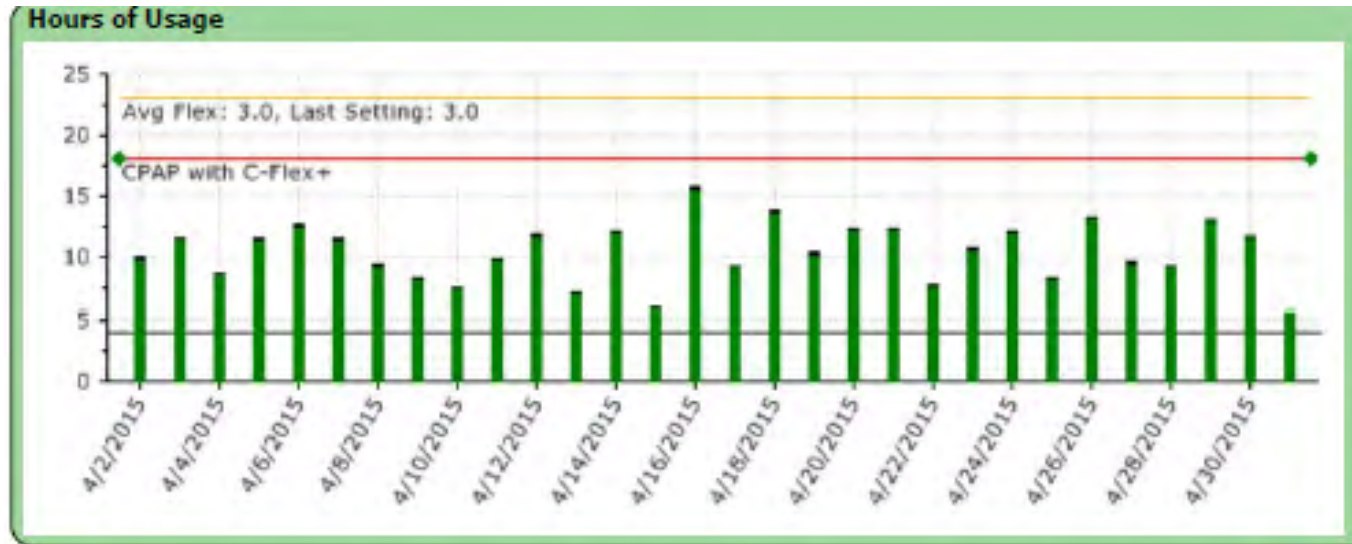
ailand
gkok | 10-12 April

Father of a 13 month old
BMI 47, AHI 41
CPAP at 13; residual AHI 3.5

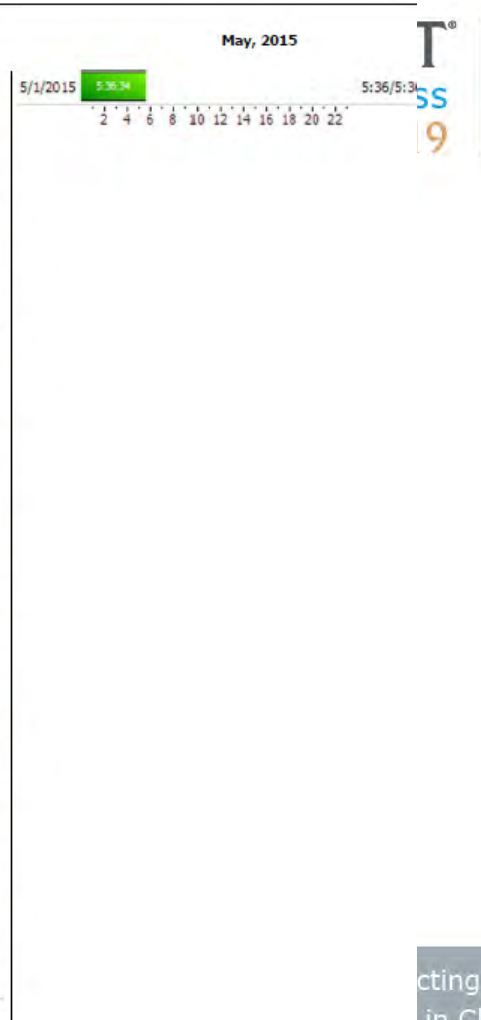
Register now at congress.chestnet.org

al Community
Chest Medicine

Grandmother of same 13 month old
BMI 35, AHI 26
CPAP at 11; residual AHI 2.7



Grandmother of same 13 month old
 BMI 35, AHI 26
 CPAP at 11; residual AHI 2.7



Thailand
 Bangkok | 10-12 April

Register now at congress.chestnet.org

Building a Global Community
 in Clinical Chest Medicine

When the 13 month old is 13 years old, what circadian rhythm disorder is she at risk for?

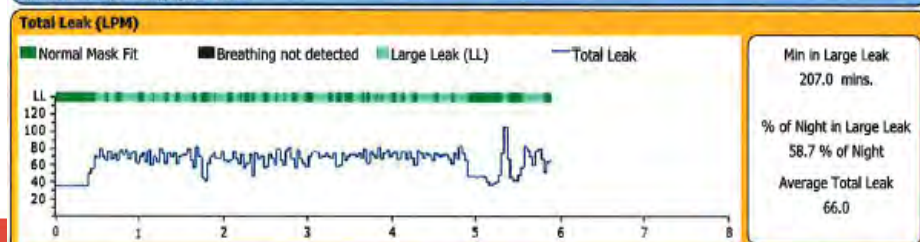
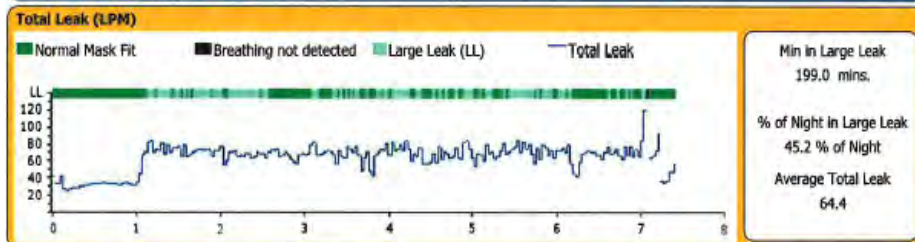
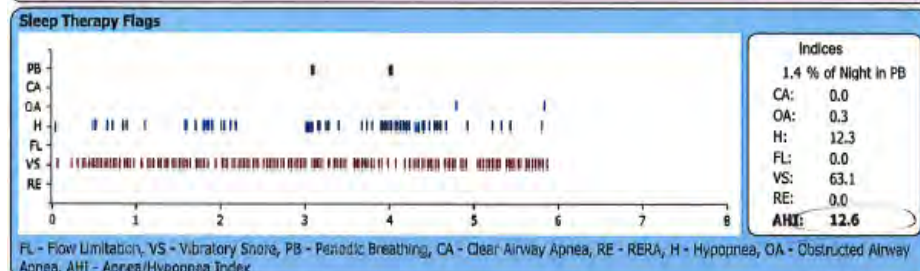
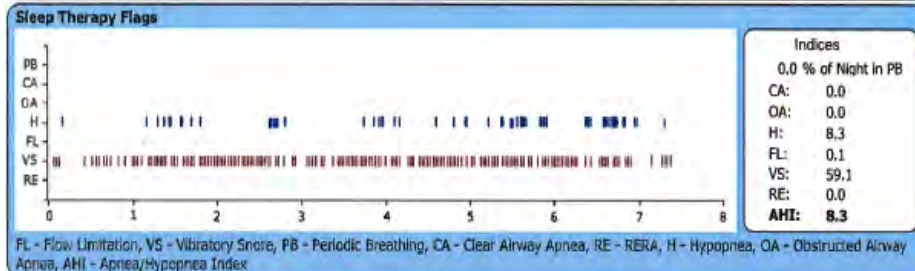
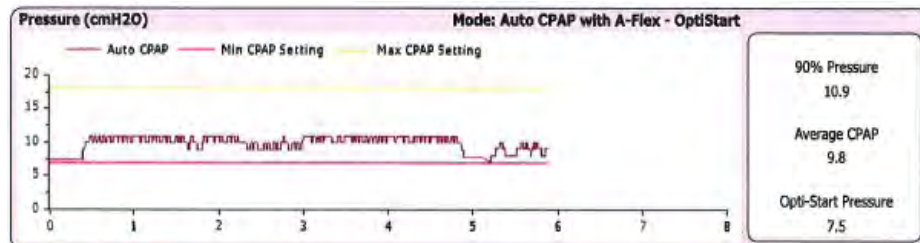
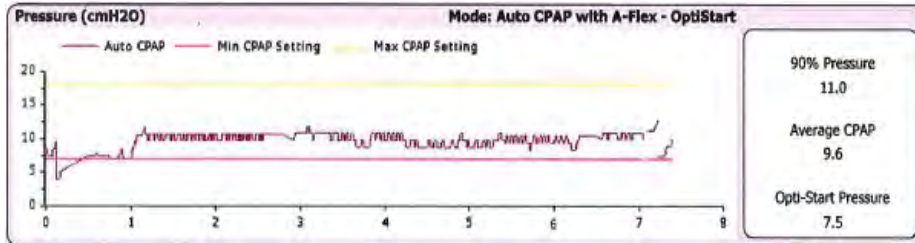
- A. Irregular sleep wake rhythm disorder
- B. Advanced sleep wake phase disorder
- C. Delayed sleep wake phase disorder
- D. Non-24 hour sleep wake rhythm disorder

When the 13 month old is 13 years old, what circadian rhythm disorder is she at risk for?

- A. Irregular sleep wake rhythm disorder
- B. Advanced sleep wake phase disorder
- C. Delayed sleep wake phase disorder
- D. Non-24 hour sleep wake rhythm disorder

PAP Download #9

Humidifier Chamber Leak



PAP Download #10

- A 75 year old man diagnosed with severe OSA and on CPAP of 17
- His bedtime is midnight to 8.00. However; he frequently woke up in the morning without his CPAP mask

Full Patient Report

Jitrig Serttabud | 29 Oct 2018

Compliance Statistics

Progress over a 60-day period:

From Setup Date

Start Date - End Date:	30/8/2018 - 28/10/2018			22/5/2018 - 28/10/2018		
Total Days Device Used	58	Day(s)	(97%)	145	Day(s)	(91%)
Total Days Device Not Used	2	Day(s)	(3%)	15	Day(s)	(9%)
Days Device Used Greater than 4 hours	37	Day(s)	(62%)	101	Day(s)	(63%)
Average Used (Days on Therapy)	4	hrs	7 mins	4	hrs	20 mins
Average Used (All Days)	3	hrs	58 mins	3	hrs	55 mins

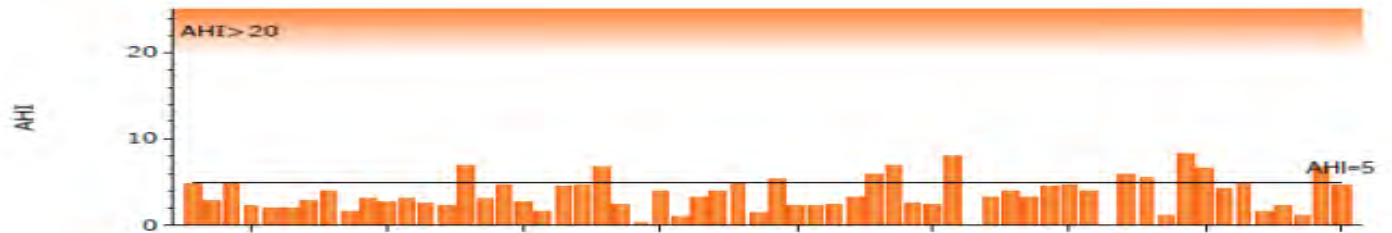
Efficacy Statistics

(All efficacy statistics are averages over the report period.)

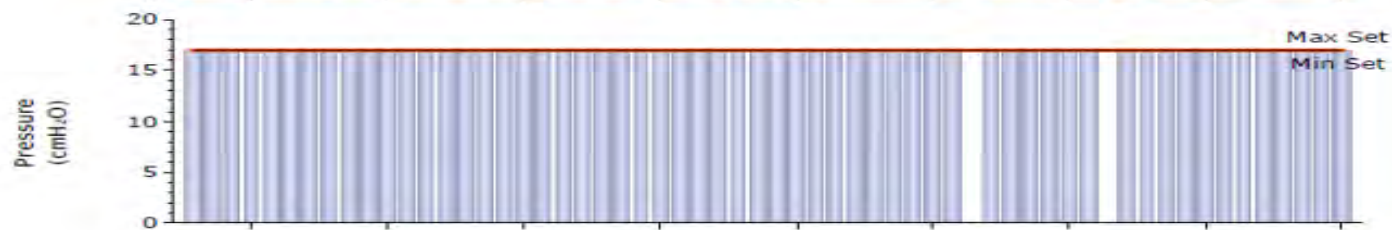
AHI	3.7	
Apnea Length	14	s
AutoCPAP Pressure	17.0	cmH2O
90th Percentile Pressure	17.0	cmH2O
% Time at Maximum Set Pressure	0%	
System Leak	69.0	l/min
90th Percentile System Leak	92.0	l/min
% Time with Excessive Leak	52%	

SensAwake Statistics

Average Number of SensAwake Detections	0	per night
% Time with SensAwake On	0%	

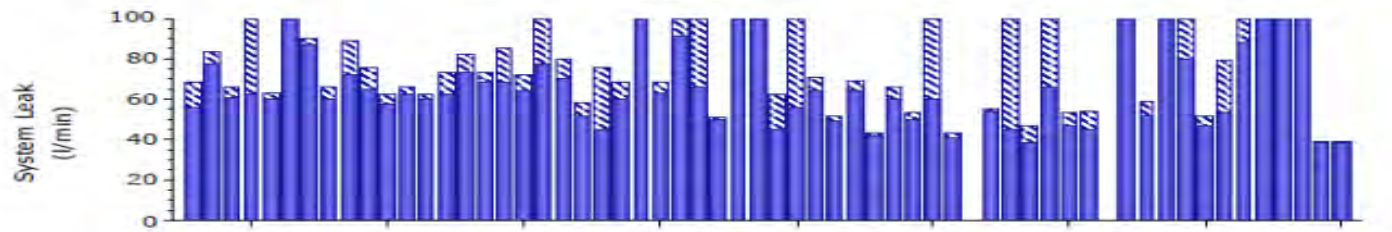


Events per hour
 AHI: 3.7
 AI: 0.1
 HI: 3.6



Pressure
 Average: 17
 90th Percentile: 17

— Max Pressure Reached ▨ 90th Percentile ■ Average



System Leak
 Average: 69
 90th Percentile: 92

▨ 90th Percentile ■ Average



Usage
 Average: 4
 Days Used: 100%

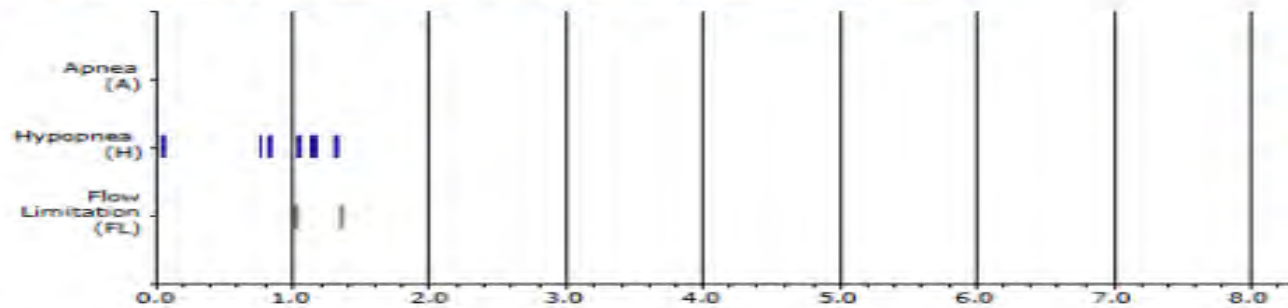
COMPLIANCE SUMMARY

Prescription History

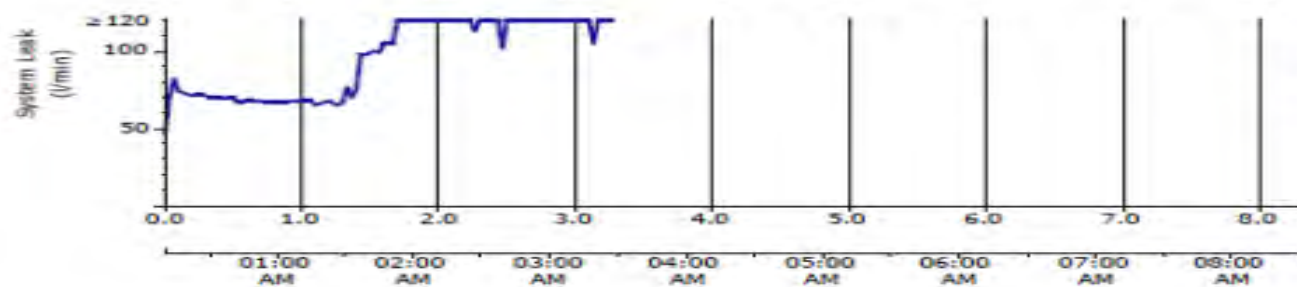
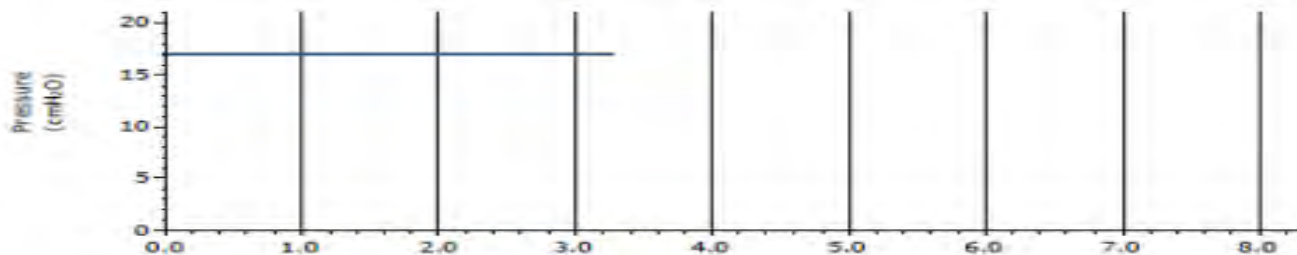
P: 17, H: 0



Thursday, October 25, 2018(26/10/2018 12:10:28AM - 26/10/2018 3:28:28AM)



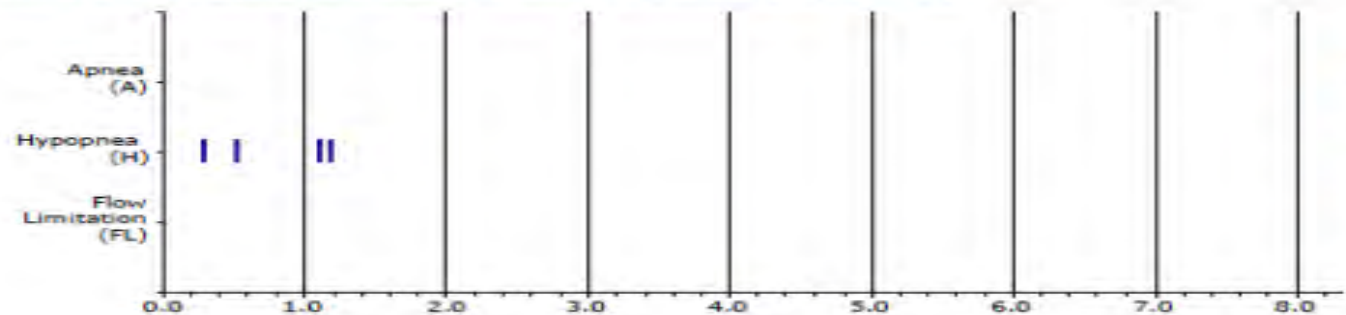
Total Apnea: 0
 AI: 0
Total Hypopnea: 7
 HI: 2.3
AHI: 2.3
 Total Flow Limitations: 2
 Flow Limitation/hr: 1



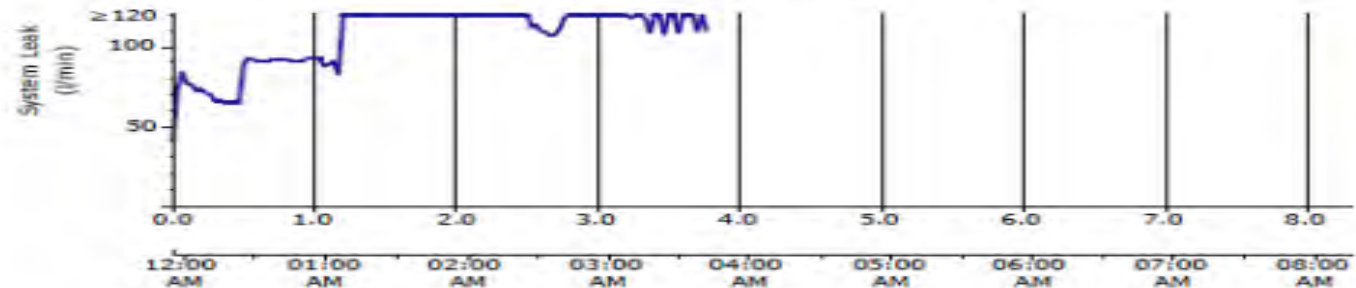
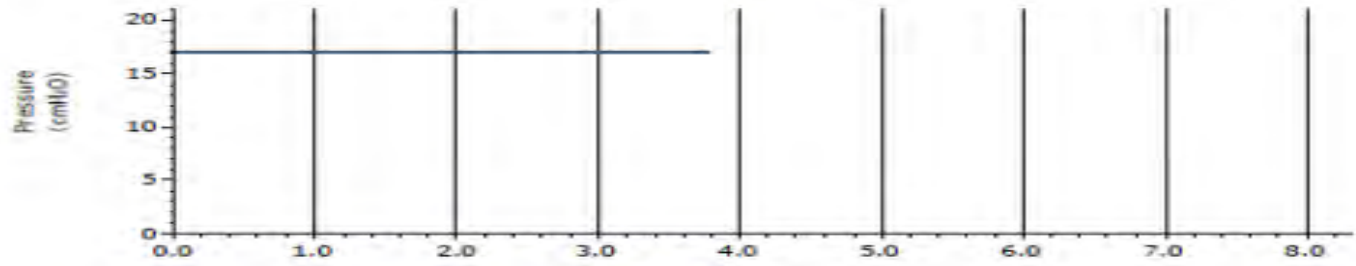
System Leak
 Median: 105
 90th Percentile: 134
 % Time with Excessive Leak: 98%

Total Usage: 3h 0m
 Total Run Time: 3h 18m
 Percentage Usage: 91%

Friday, October 26, 2018 (26/10/2018 11:54:56PM - 27/10/2018 3:42:56AM)



Total Apnea: 0
 AI: 0
Total Hypopnea: 4
 HI: 1.2
AHI: 1.2
 Total Flow Limitations: 0
 Flow Limitation/hr: 0



System Leak
 Median: 123
 90th Percentile: 132
 % Time with Excessive Leak: 99%

Total Usage: 3h 18m
 Total Run Time: 3h 48m
 Percentage Usage: 87%

What is the most likely cause of his problem?

- A. Pressure intolerance
- B. Excessive leak
- C. Occult periodic leg movement during sleep
- D. The use of alcohol before bedtime

What is the most likely cause of his problem?

A. Pressure intolerance

B. Excessive leak

C. Occult periodic leg movement during sleep

D. The use of alcohol before bedtime

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Jitrig Serttabud | 29 Oct 2018

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Average Used (Days on Therapy)	4	hrs	7 mins	4	hrs	20 mins
Average Used (All Days)	3	hrs	58 mins	3	hrs	55 mins

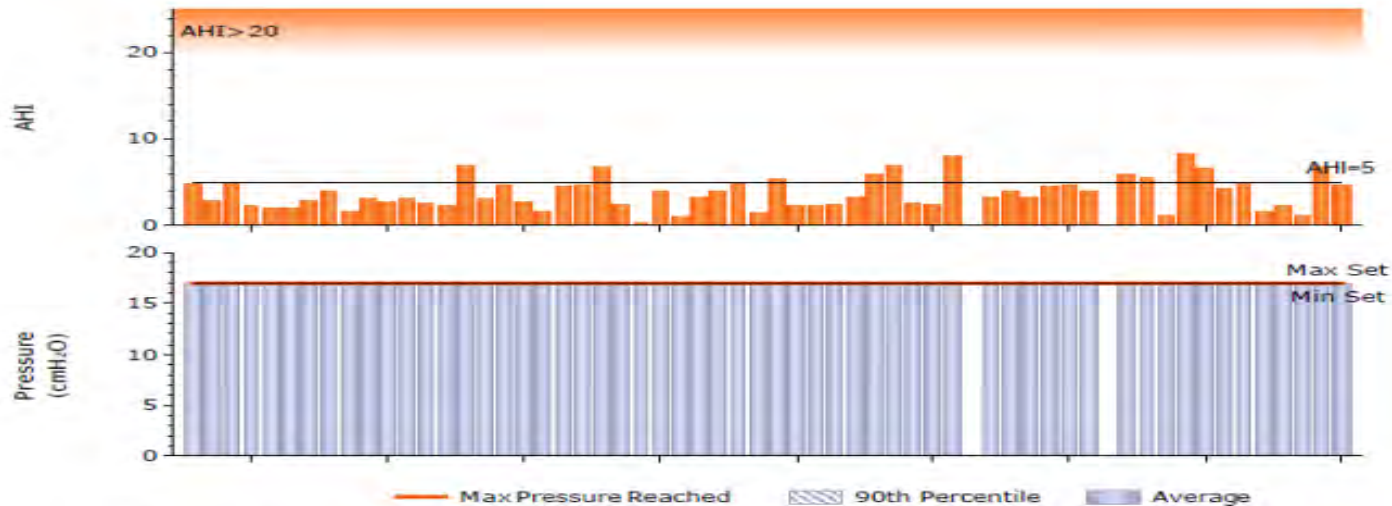
Efficacy Statistics

(All efficacy statistics are averages over the report period.)

AHI	3.7	
Apnea Length	14	s
AutoCPAP Pressure	17.0	cmH2O
90th Percentile Pressure	17.0	cmH2O
% Time at Maximum Set Pressure	0%	
System Leak	69.0	l/min
90th Percentile System Leak	92.0	l/min
% Time with Excessive Leak	52%	

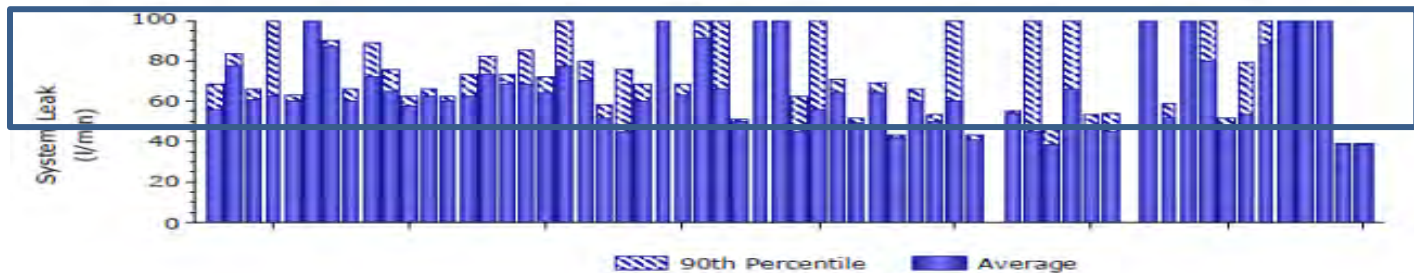
SensAwake Statistics

Average Number of SensAwake Detections	0	per night
% Time with SensAwake On	0%	

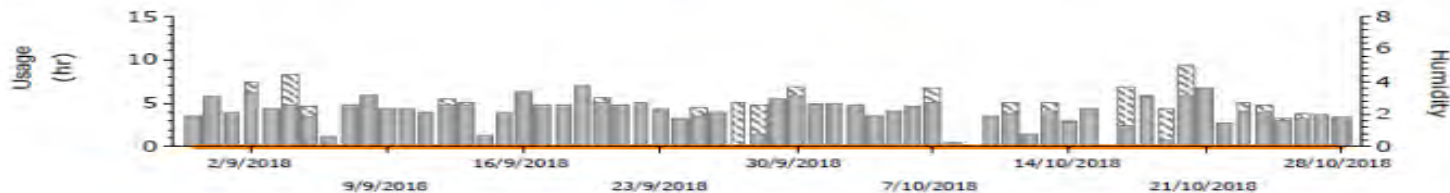


Events per hour
 AHI: 3.7
 AI: 0.1
 HI: 3.6

Pressure
 Average: 17
 90th Percentile: 17



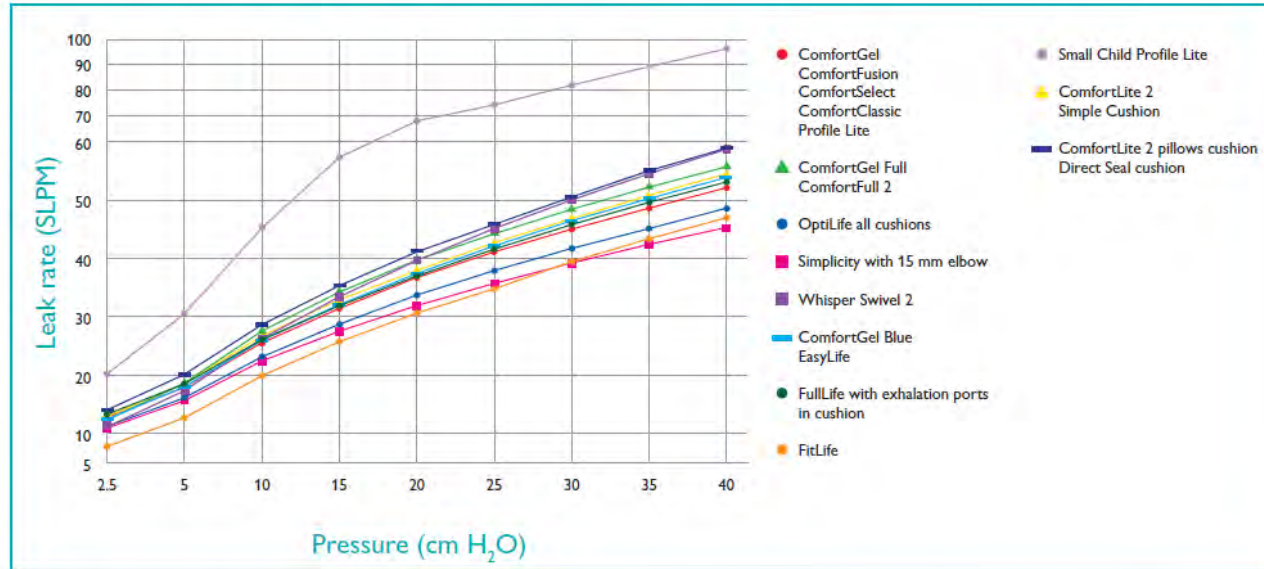
System Leak
 Average: 69
 90th Percentile: 92



Usage
 Average: 4
 Days Used: 100%

What is the acceptable leak?

Mask and exhalation ports – pressure vs. flow



Respironics, ComfortClassic, ComfortFull, ComfortFusion, ComfortGel, ComfortLite, ComfortSelect, Direct Seal, EasyLife, FitLife, FullLife, OptiLife, Profile Lite, Simple Cushion, Simplicity, and Whisper Swivel are trademarks of Respironics, Inc. and its affiliates. All rights reserved.

Total leak = intentional leak + unintentional leak

Excessive leak

- Increased side effects
- Poor compliance
- Risk factors of central apnea

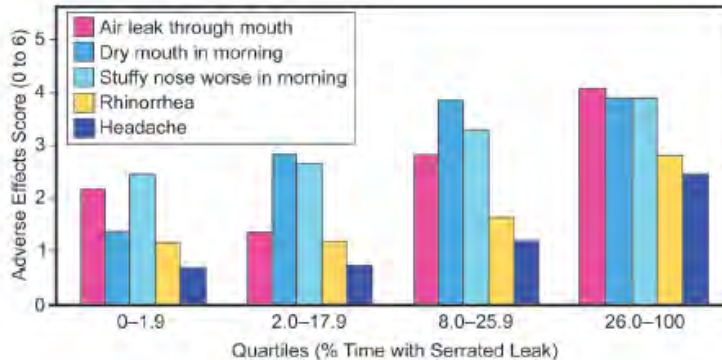


Fig. 2. Adverse effects of nasal CPAP relative to the quartiles of percent of time with serrated leak profile. There is an increasing frequency of adverse effects with increasing serrated leak time ($P < .001$).

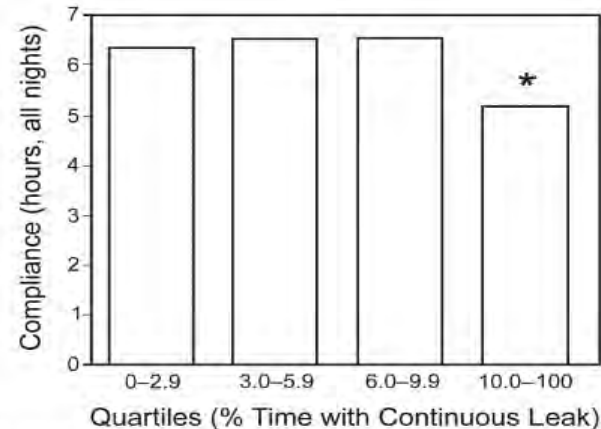


Fig. 3. Nasal CPAP adherence with respect to the quartiles of percent of time with continuous leak. * $P = .07$.

Full Patient Report

Jitrig Serttabud | 29 Oct 2018

Compliance Statistics

Progress over a 60-day period:

From Setup Date

Start Date - End Date:	30/8/2018 - 28/10/2018			22/5/2018 - 28/10/2018		
Total Days Device Used	58	Day(s)	(97%)	145	Day(s)	(91%)
Total Days Device Not Used	2	Day(s)	(3%)	15	Day(s)	(9%)
Days Device Used Greater than 4 hours	37	Day(s)	(62%)	101	Day(s)	(63%)
Average Used (Days on Therapy)	4	hrs	7 mins	4	hrs	20 mins
Average Used (All Days)	3	hrs	58 mins	3	hrs	55 mins

Efficacy Statistics

(All efficacy statistics are averages over the report period.)

AHI	3.7
Apnea Length	14 s
AutoCPAP Pressure	17.0 cmH2O
90th Percentile Pressure	17.0 cmH2O
% Time at Maximum Set Pressure	0%
System Leak	69.0 l/min
90th Percentile System Leak	92.0 l/min
% Time with Excessive Leak	52%

SensAwake Statistics

Average Number of SensAwake Detections	0	per night
% Time with SensAwake On	0%	

Detects wakefulness

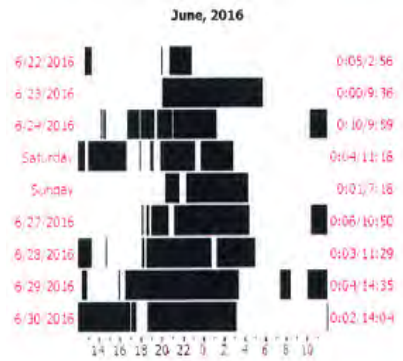


Promptly relieves pressure



Eases the return to sleep





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Another case
“Blow By”
Did not like to
wear it on her
face, but like
the air blowing
over her face

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Case #11

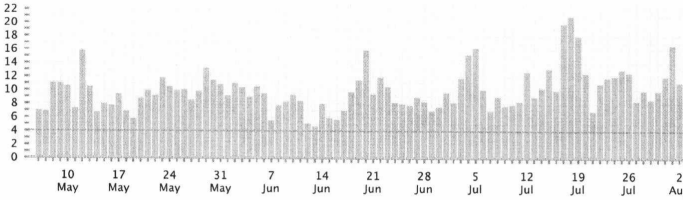
- 46 year old woman
- Diagnosed with OSA 8 months ago (AHI 56); initially struggled with CPAP (autoPAP) but now uses it
- Has multiple social stressors (messy divorce, raising twins on her own, long commute [150 miles], stressful job)
- Tearful in the office

Complaining about CPAP pressure!!

PAP Download #11

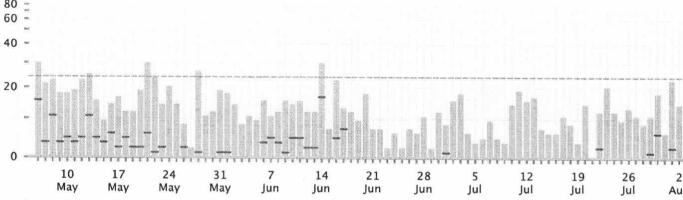
Usage (hours)

Usage days **90/90 (100%)**
 >= 4 hour days **90 (100%)**
 < 4 hour days **0 (0%)**
 Days not used **0 (0%)**
 Days no data **0 (0%)**
 Used/day (avg.) **10.0 hrs.**



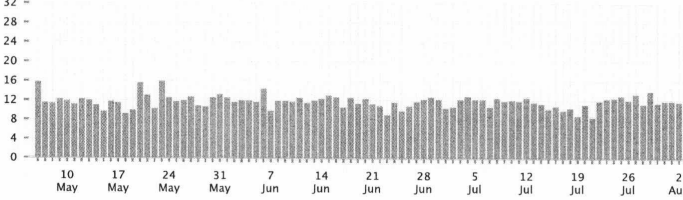
Leak (L/min)

Set threshold **24.0 L/min**
 Maximum (avg) **47.1**
 95th % (avg) **13.0**
 Median (avg) **1.9**



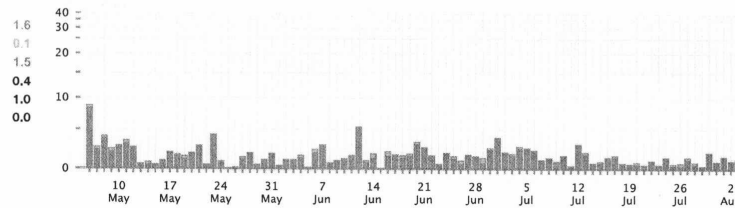
Pressure (cmH2O)

Set mode **AutoSet**
 Set EPR **Fulltime**
 Set Max Pressure **2.0**
 Set Min Pressure **16.0**
 Maximum (avg) **7.0**
 95th % (avg) **13.5**
 Median (avg) **11.8**
 Median (avg) **8.3**



AHI (events/hour)

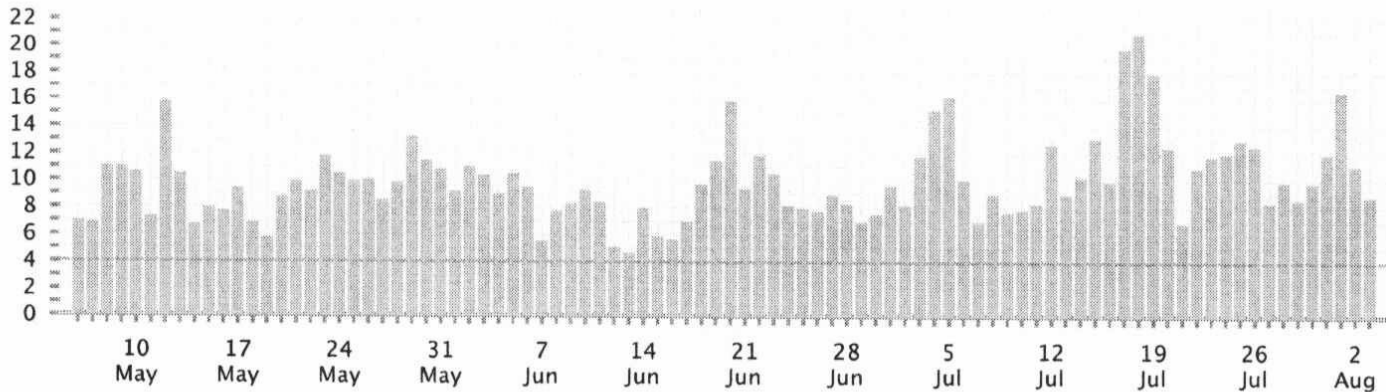
AHI
 HI
 AI
 CAI
 OAI
 UAI



Usage (hours)

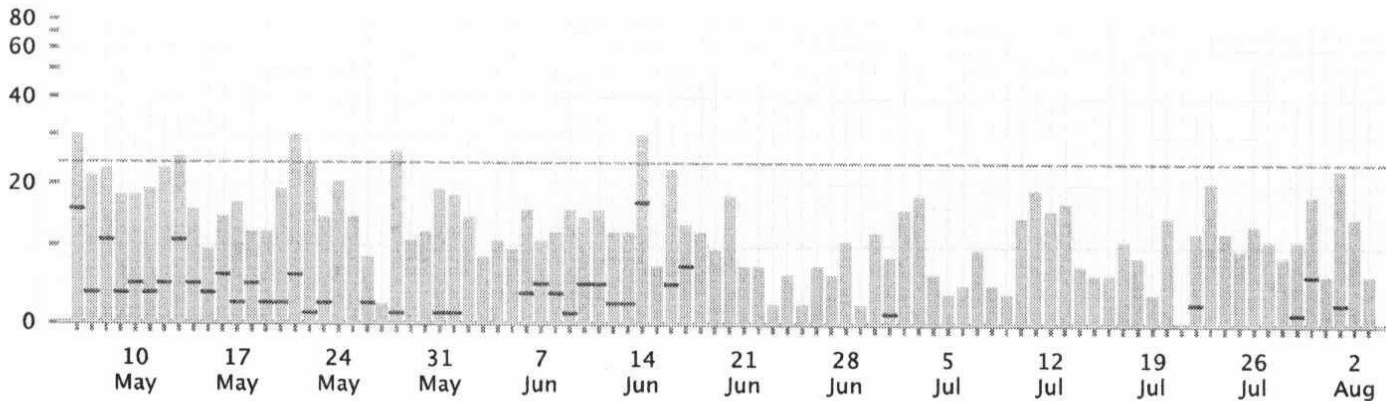
Usage days **90/90 (100%)**
>= 4 hour days **90 (100%)**
< 4 hour days **0 (0%)**
Days not used **0 (0%)**
Days no data **0 (0%)**

Used/day (avg.) **10.0 hrs.**

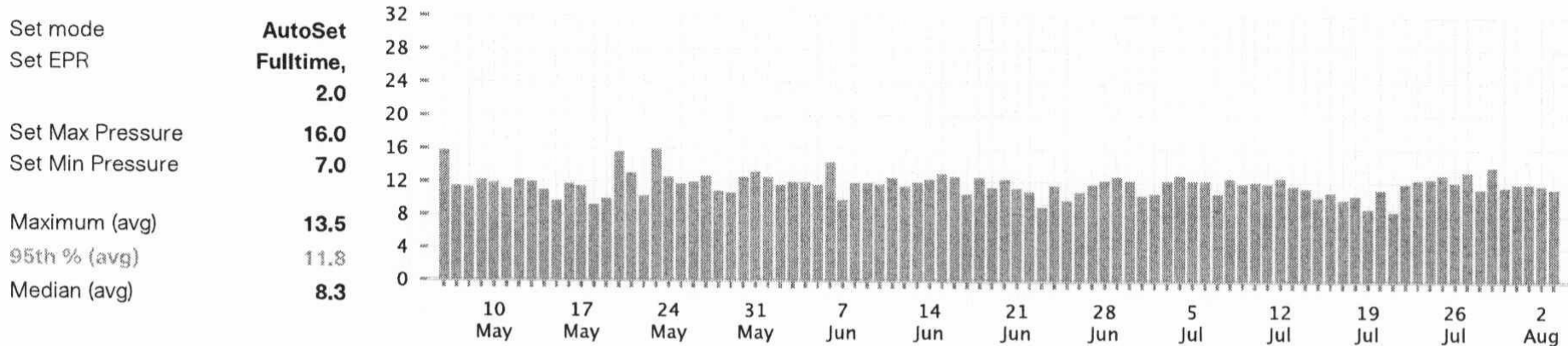


Leak (L/min)

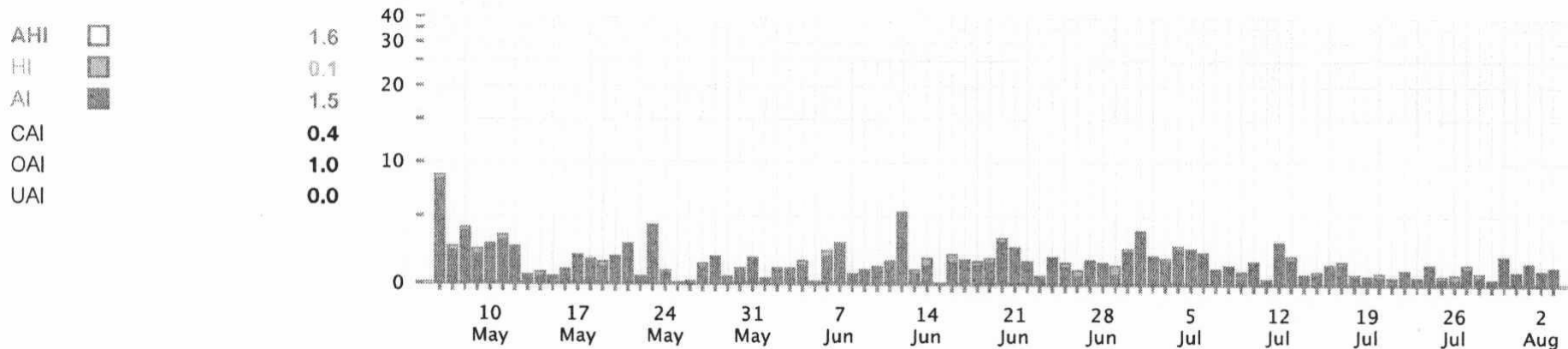
Set threshold **24.0 L/min**
Maximum (avg) **47.1**
95th % (avg) **13.0**
Median (avg) **1.9**



Pressure (cmH2O)



AHI (events/hour)



What is atypical about this download?

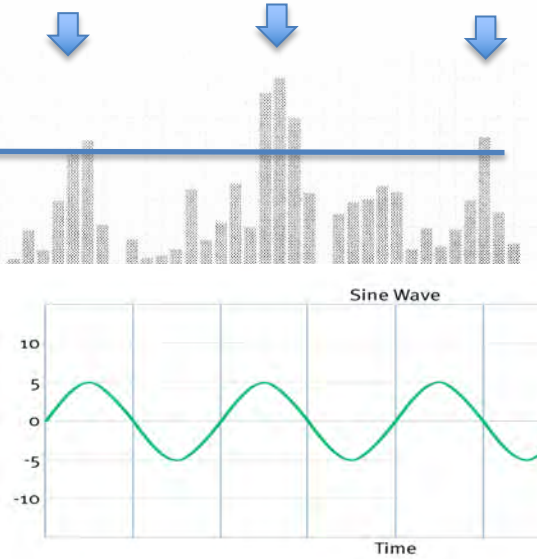
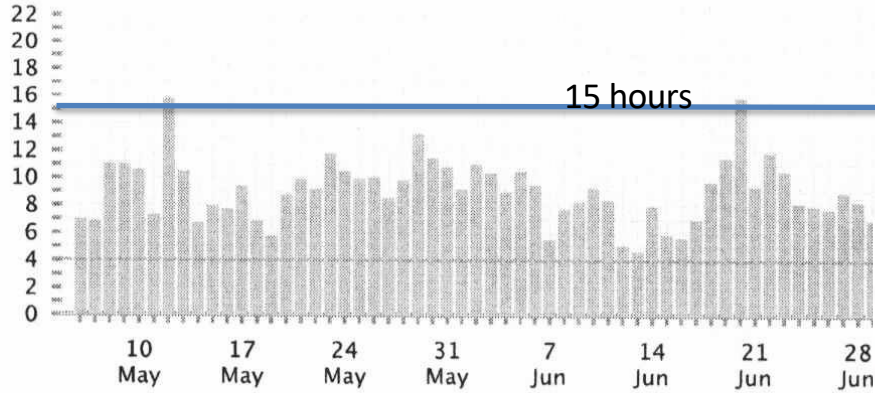
- A. Excessive leak
- B. Elevated AHI
- C. Marked variability in pressure needs
- D. Insufficient usage
- E. Marked variable usage

What is atypical about this download?

- A. Excessive leak
- B. Elevated AHI
- C. Marked variability in pressure needs
- D. Insufficient usage
- E. Marked variable usage

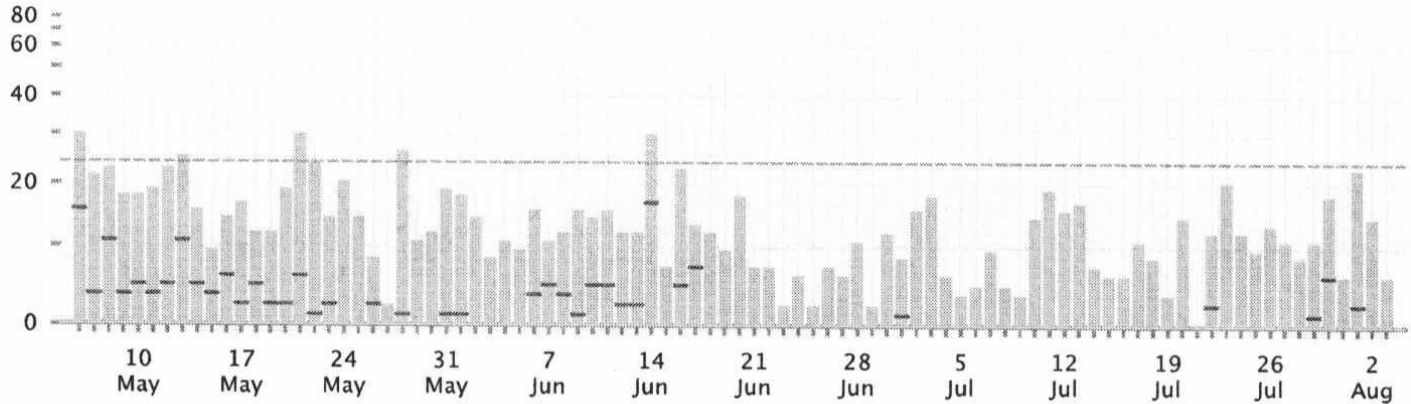
Usage (hours)

Usage days **90/90 (100%)**
 >= 4 hour days **90 (100%)**
 < 4 hour days **0 (0%)**
 Days not used **0 (0%)**
 Days no data **0 (0%)**
 Used/day (avg.) **10.0 hrs.**



Leak (L/min)

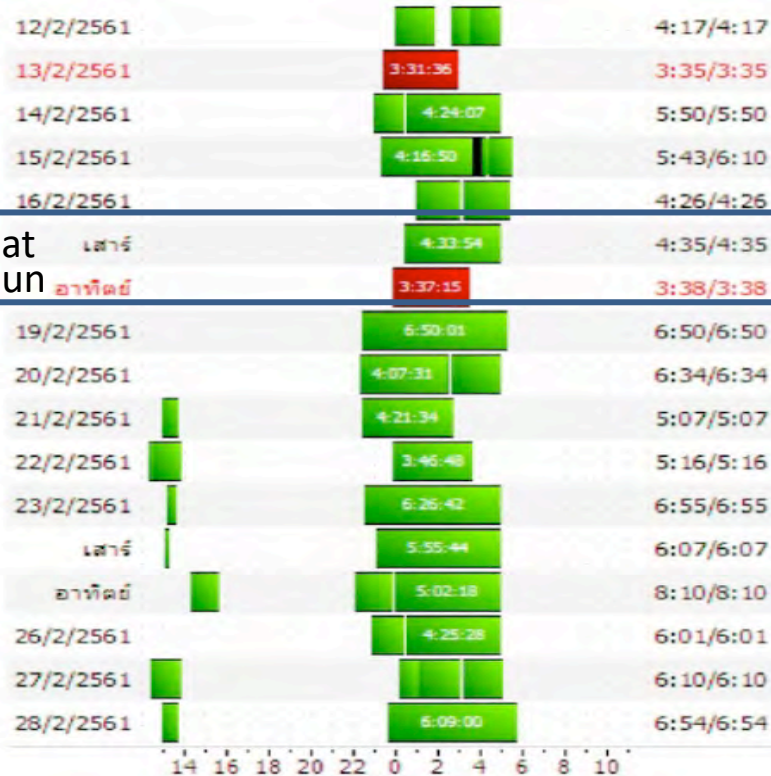
Set threshold **24.0 L/min**
 Maximum (avg) **47.1**
 95th % (avg) **13.0**
 Median (avg) **1.9**



Weekend non compliant user

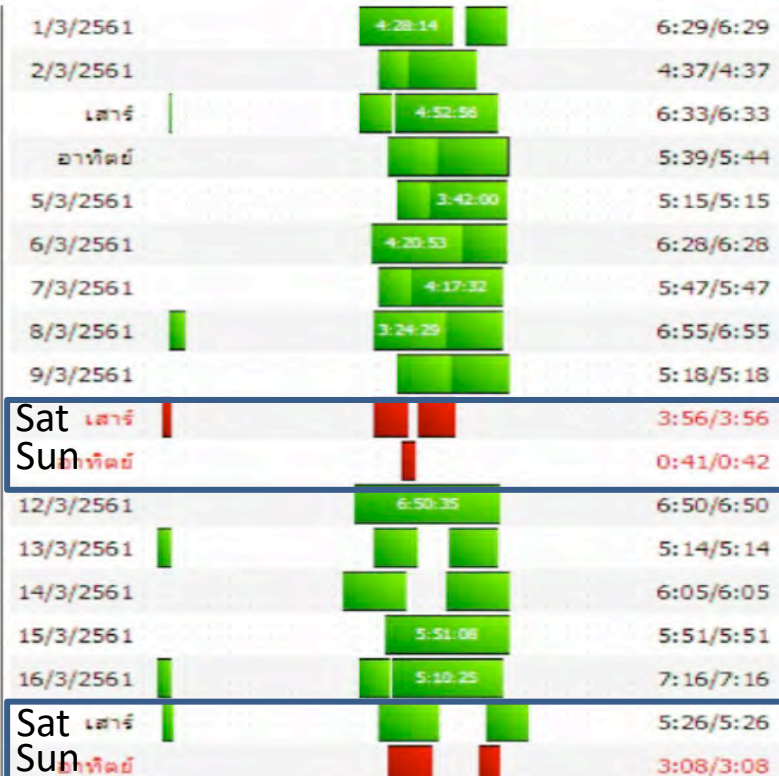
Patterns of Use

พฤหัสบดี, 2561



Sat
Sun

วันอาทิตย์, 2561



Sat
Sun

Complaining about CPAP pressure!!

PAP Download #12

Compliance Summary

Date Range	10/27/2016 - 12/15/2016 (50 days)
Days with Device Usage	50 days
Days without Device Usage	0 days
Percent Days with Device Usage	100.0%
Cumulative Usage	14 days 6 hrs. 52 mins. 2 secs.
Maximum Usage (1 Day)	8 hrs. 38 mins. 29 secs.
Average Usage (All Days)	6 hrs. 51 mins. 26 secs.
Average Usage (Days Used)	6 hrs. 51 mins. 26 secs.
Minimum Usage (1 Day)	3 hrs. 23 mins. 56 secs.
Percent of Days with Usage \geq 4 Hours	96.0%
Percent of Days with Usage $<$ 4 Hours	4.0%
Total Blower Time	14 days 8 hrs. 41 mins. 12 secs.

Auto CPAP Summary

Auto CPAP Mean Pressure	8.5 cmH ₂ O
Auto CPAP Peak Average Pressure [®]	10.9 cmH ₂ O
Average Device Pressure \leq 90% of Time	10.6 cmH ₂ O
Average Time in Large Leak Per Day	6 mins. 23 secs.
Average AHI	9.6

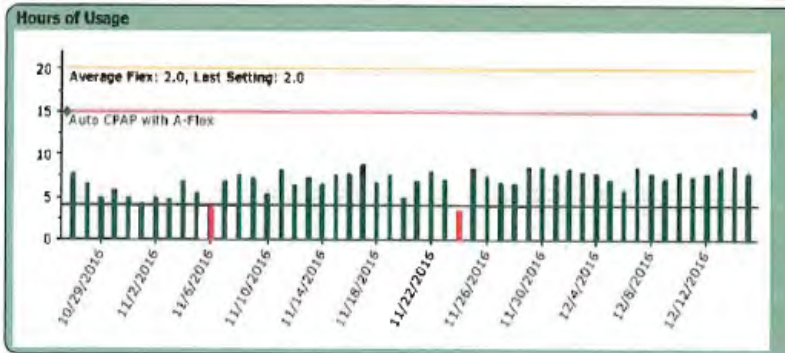
Patterns of Use



November, 2016

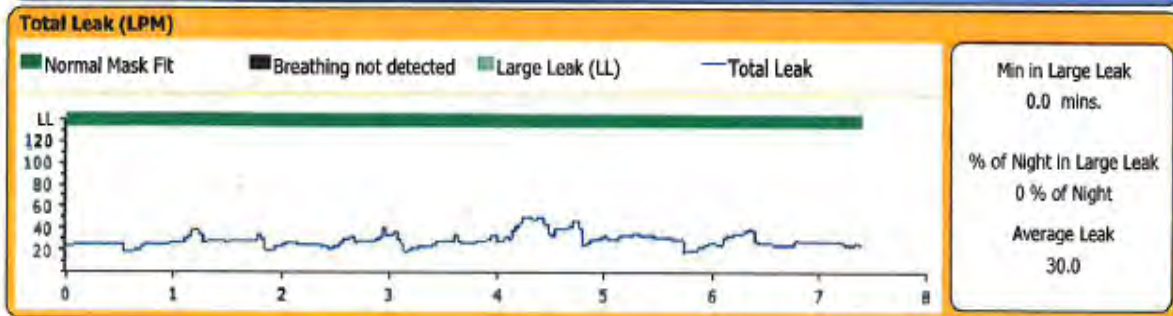
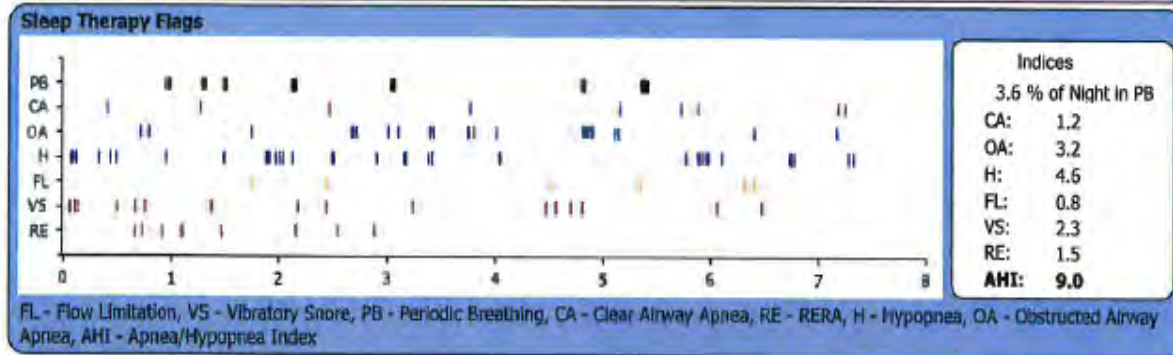
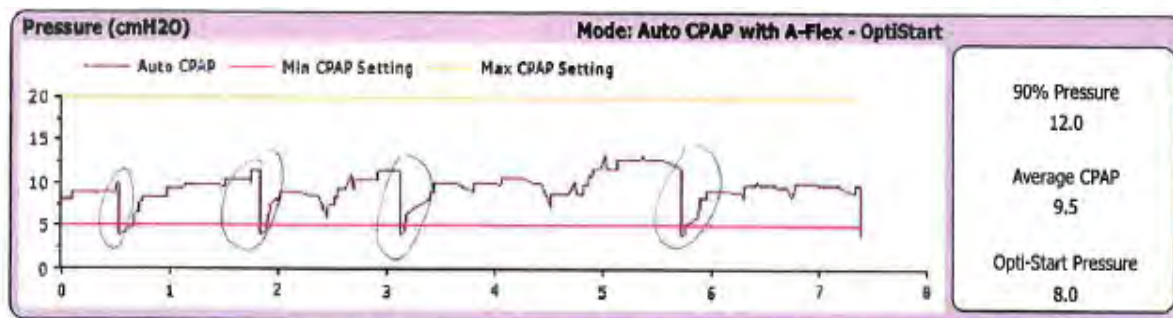


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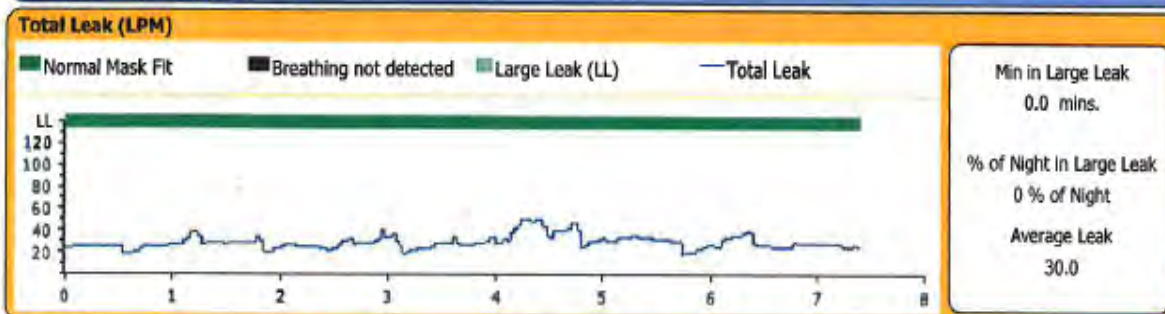
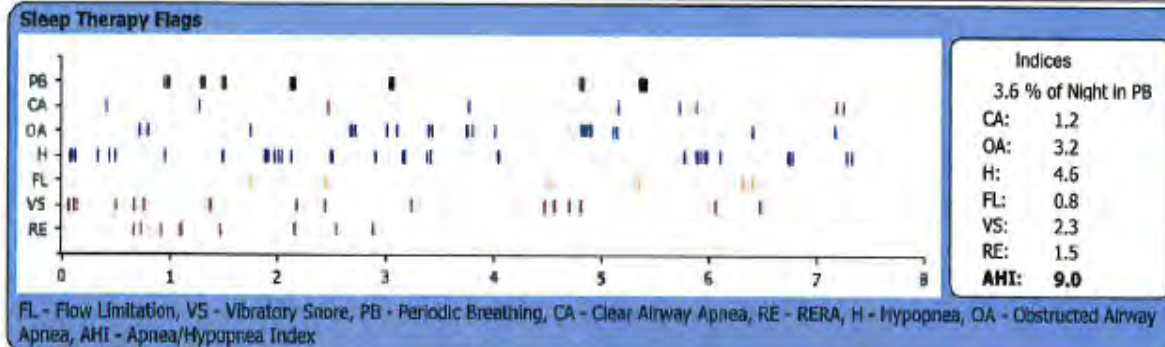
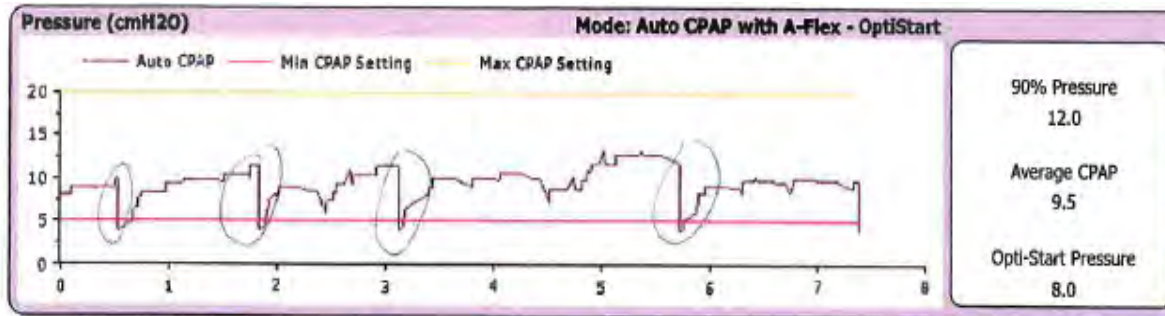


What is cause of circled pressure changes?

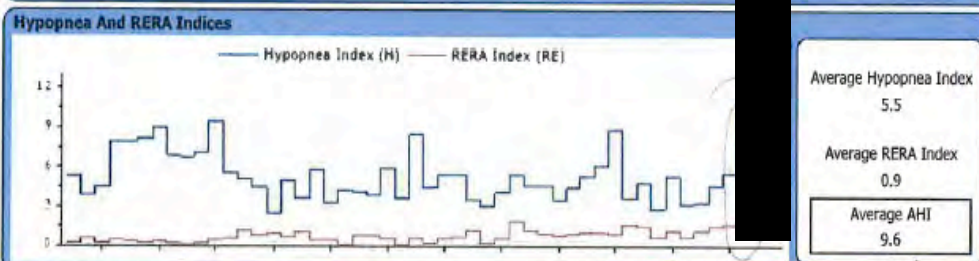
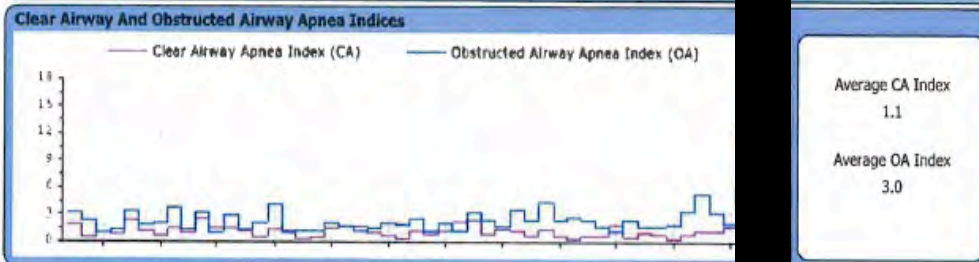
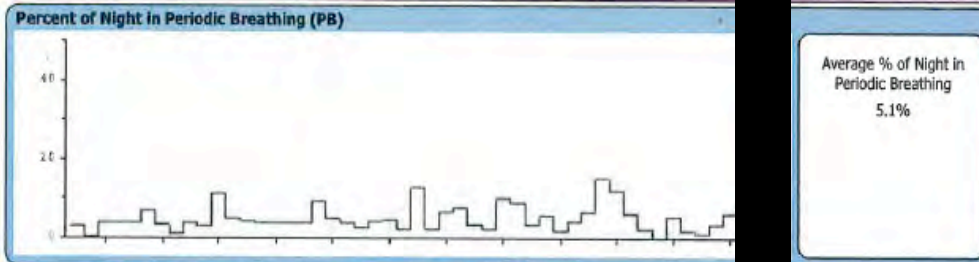
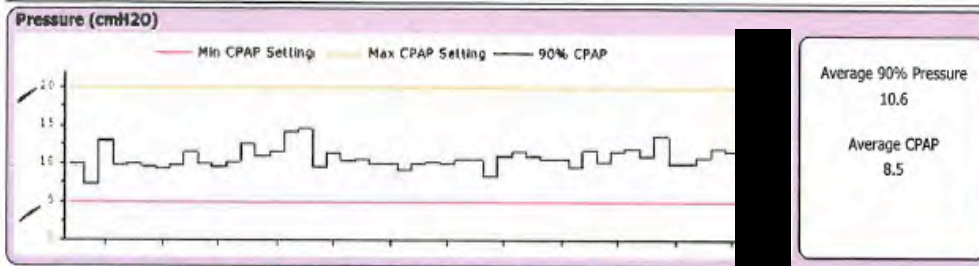
- A. APAP response to obstructive events
- B. APAP response to central events
- C. Machine malfunction
- D. Patient ramping down device

What is cause of circled pressure changes?

- A. APAP response to obstructive events
- B. APAP response to central events
- C. Machine malfunction
- D. Patient ramping down device

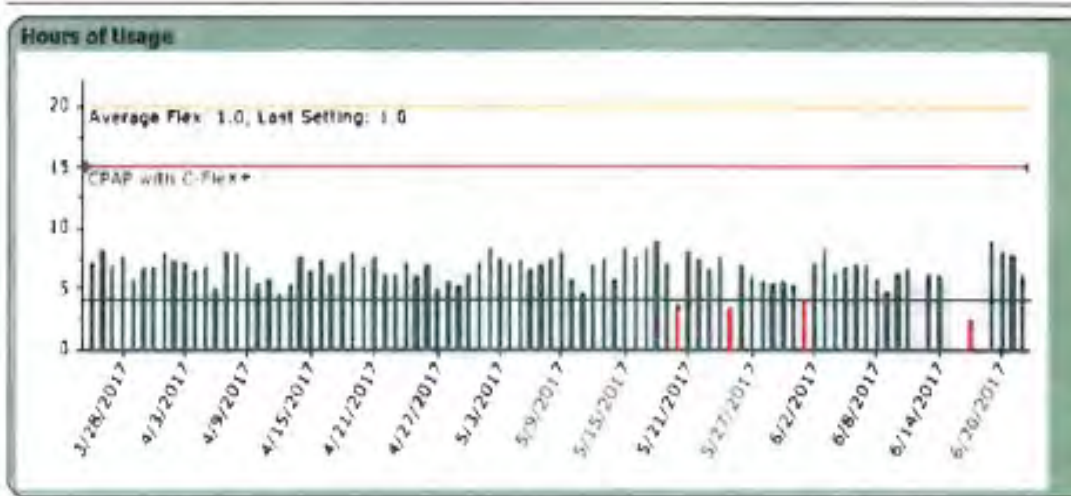


- Pressure settings:
 - 5-20 cm H2O
- Awakening from pressure elevations
- Would ramp down when it awakened him



- Went on YOU-TUBE
- Turned settings down to 5-8 cm H2O
- Made AHI go up even more

PAP Download #13



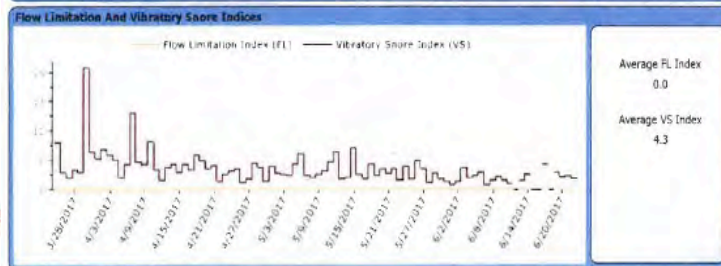
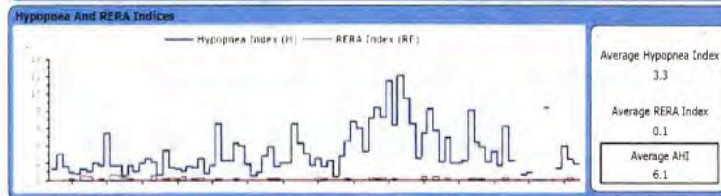
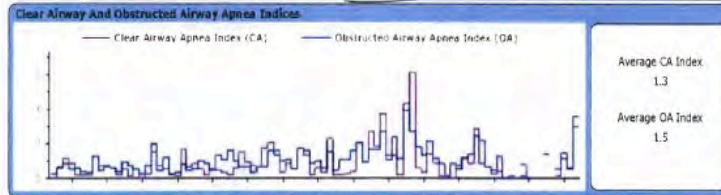
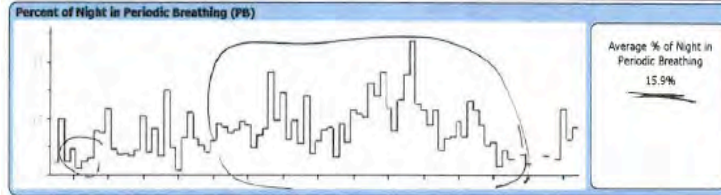
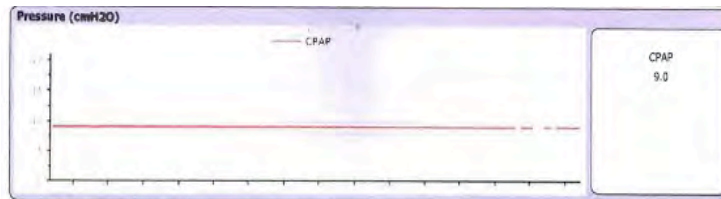
- 75 yr old with Type 2 DM, peripheral vascular disease, HTN, asthma, paroxysmal atrial fibrillation (DCCV 2009), CAD s/p CABG
- Complains of awakening with some SOB at night
- Feels like machine not working right any more and stopped using it about a month ago

Compliance Summary

Date Range	3/25/2017 - 6/22/2017 (90 days)
Days with Device Usage	86 days
Days without Device Usage	4 days
Percent Days with Device Usage	95.6%
Cumulative Usage	23 days 12 hrs. 40 mins. 8 secs.
Maximum Usage (1 Day)	9 hrs. 2 mins. 23 secs.
Average Usage (All Days)	6 hrs. 16 mins. 26 secs.
Average Usage (Days Used)	6 hrs. 33 mins. 57 secs.
Minimum Usage (1 Day)	2 hrs. 23 mins. 49 secs.
Percent of Days with Usage \geq 4 Hours	91.1%
Percent of Days with Usage $<$ 4 Hours	8.9%
Total Blower Time	23 days 17 hrs. 17 mins. 47 secs.

Sleep Therapy Statistics (Philips Respironics)

Average Time in Large Leak Per Day	2 hrs. 1 mins. 50 secs.
Average AHI	6.1
CPAP	9.0 cmH ₂ O



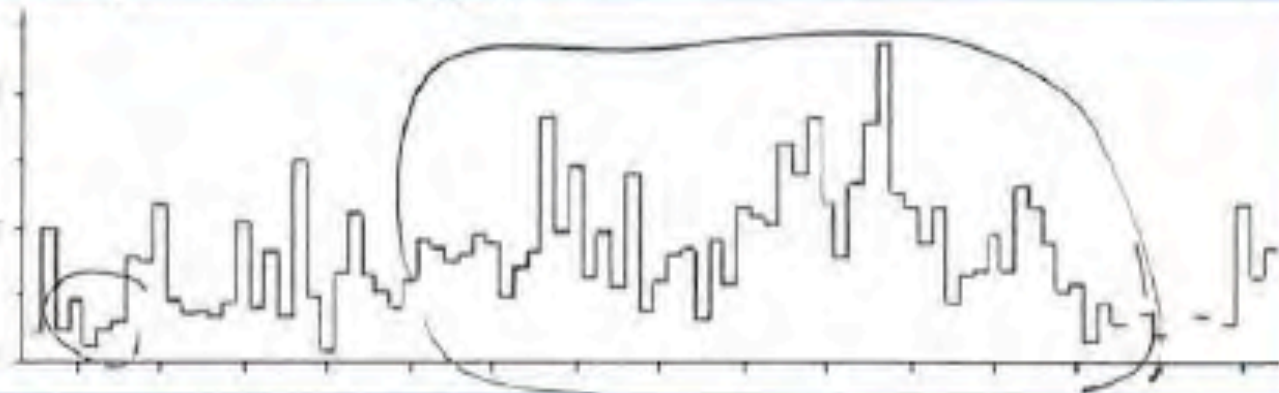
What is likely cause of worsening control of sleep disordered breathing noted?

- A. worsening allergies
- B. patient changed CPAP settings
- C. flipped back into atrial fibrillation
- D. machine mis-sensing events

What is likely cause of worsening control of sleep disordered breathing noted?

- A. worsening allergies
- B. patient changed CPAP settings
- C. flipped back into atrial fibrillation
- D. machine mis-sensing events

Percent of Night in Periodic Breathing (PB)

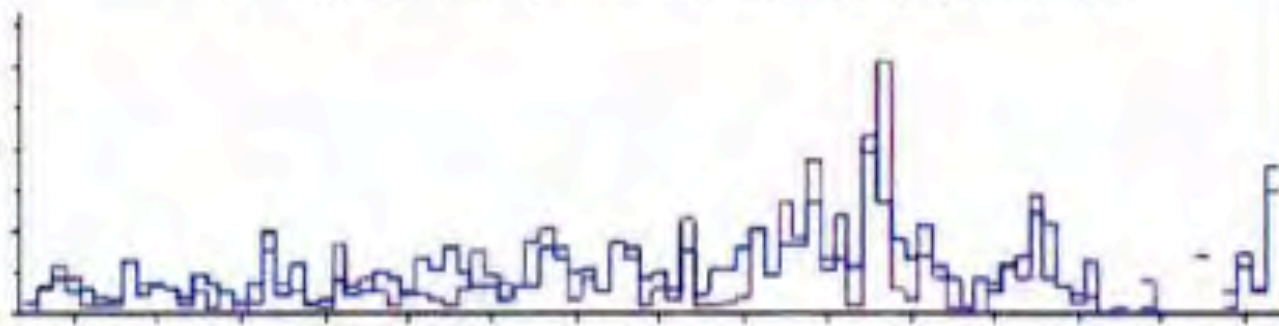
Average % of Night in
Periodic Breathing

15.9%

Clear Airway And Obstructed Airway Apnea Indices

— Clear Airway Apnea Index (CA)

— Obstructed Airway Apnea Index (OA)



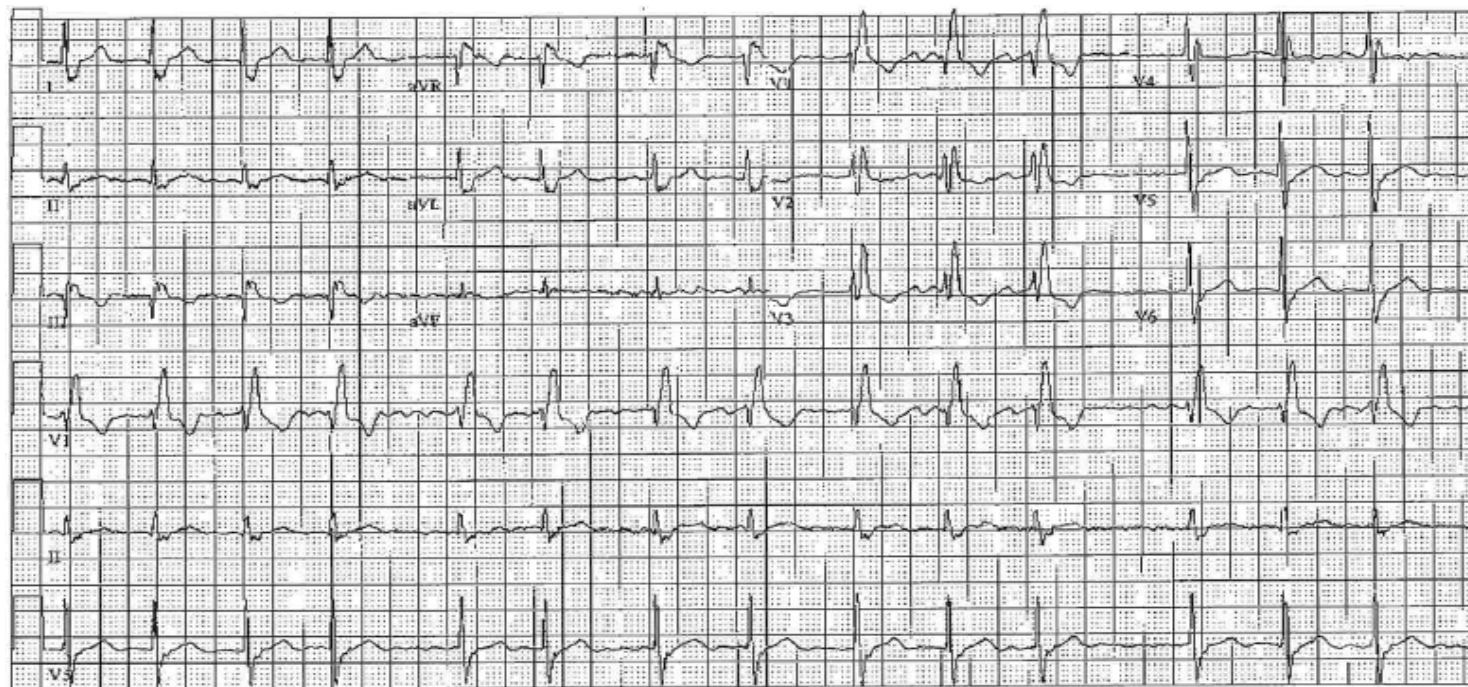
Average CA Index

1.3

Average OA Index

1.5

Atrial Fibrillation

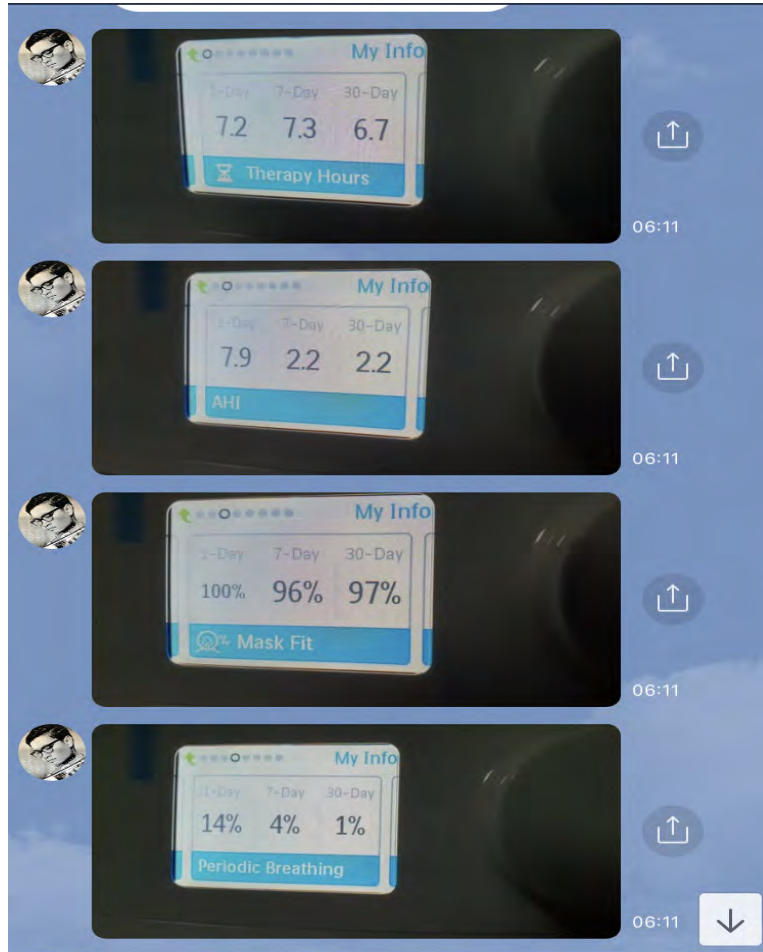


Case 14

A 79 year old physician patient with underlying CHF EF 25% with AICD diagnosed with moderate OSA and CSA-CSB

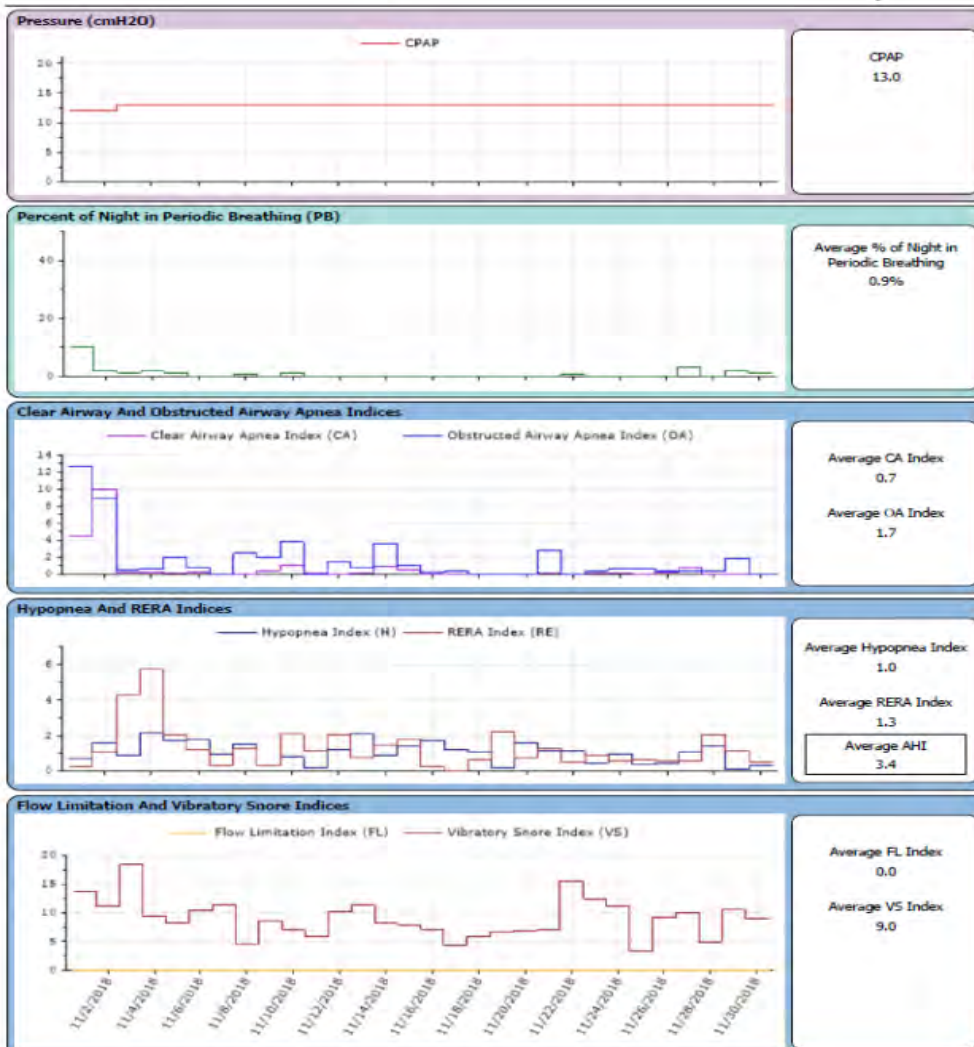
He is currently using CPAP of 13 in which he has been sending you daily data via line

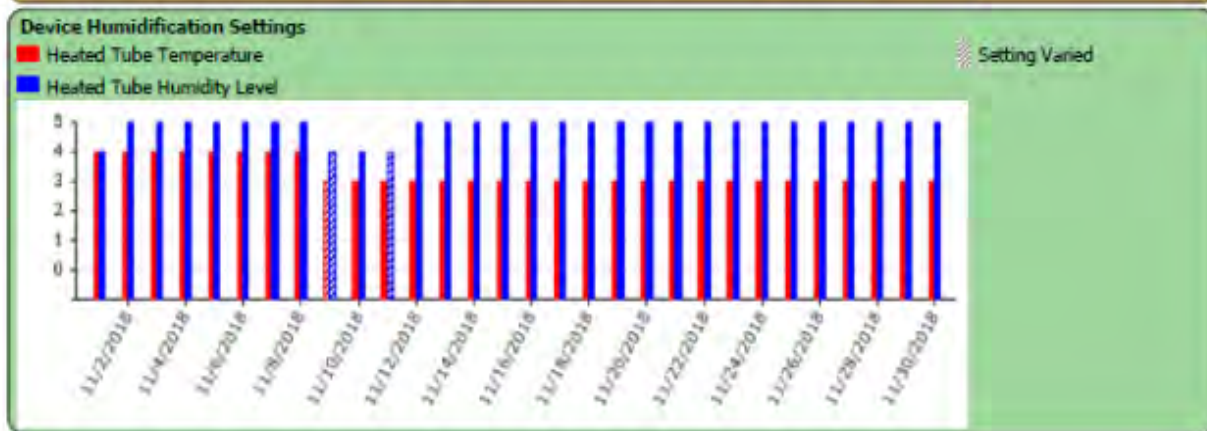
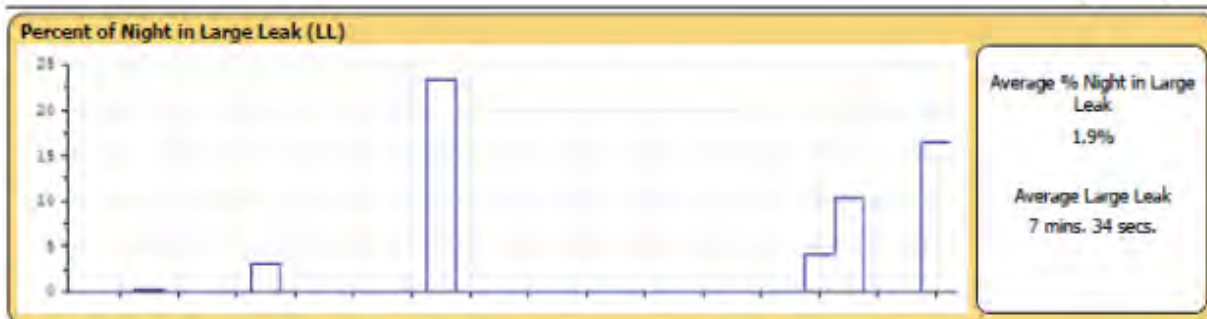




- His last downloaded data as following







What would you do next ?

- A. Ask about the symptoms of dry throat
- B. Ask him to check his pulse oximeter at home
- C. Ask him to lower the pressure by 1 cm of water and observe
- D. Reassure

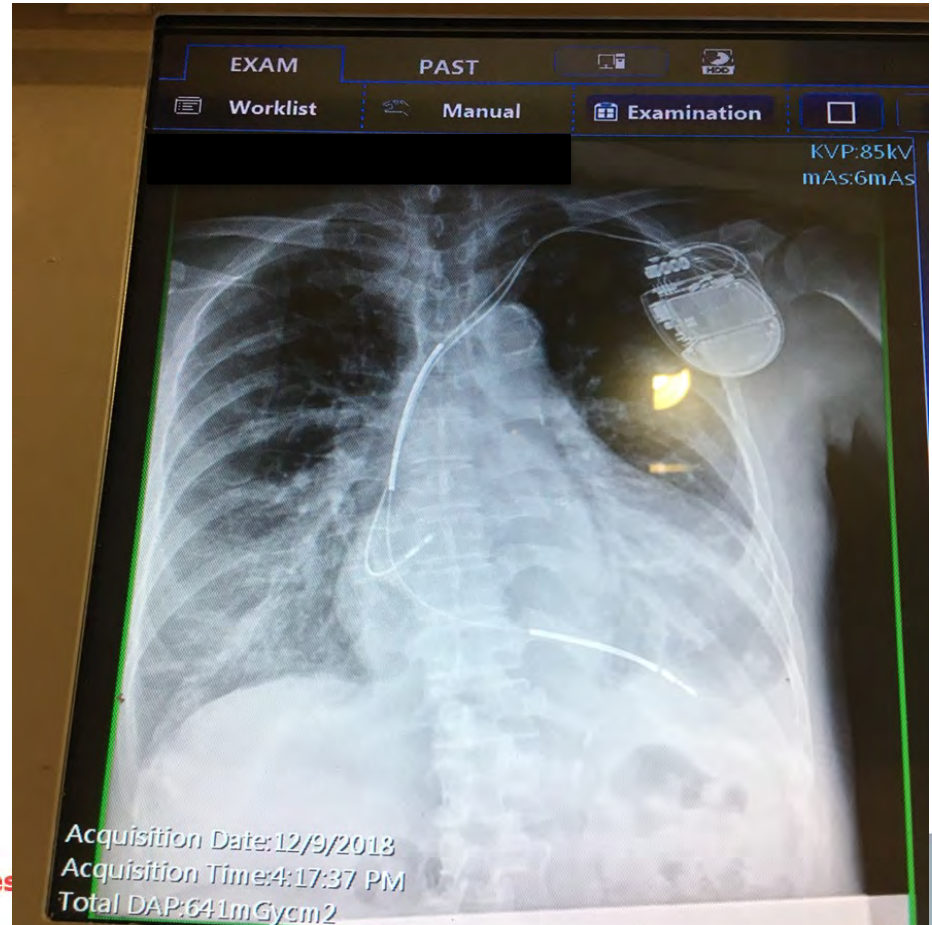
What would you do next ?

- A. Ask about the symptoms of dry throat
- B. Ask him to check his pulse oximeter at home
- C. Ask him to lower the pressure by 1 cm of water and observe
- D. Reassure

Room air oxygen saturation of 88%

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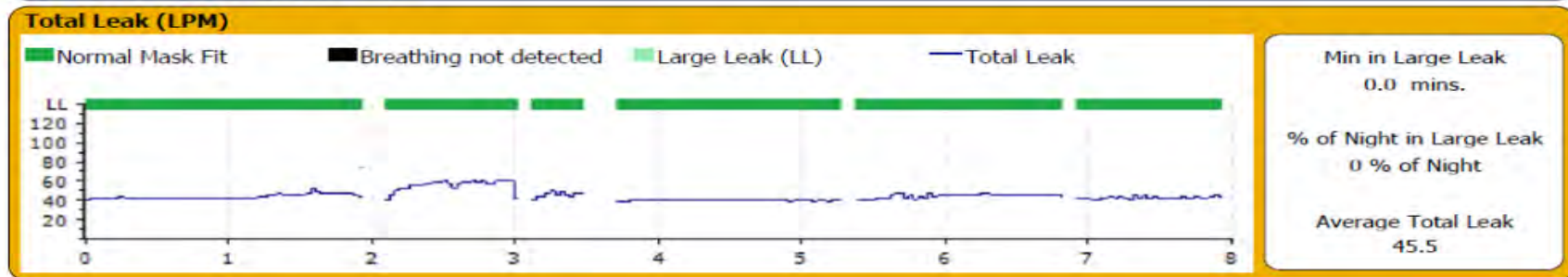
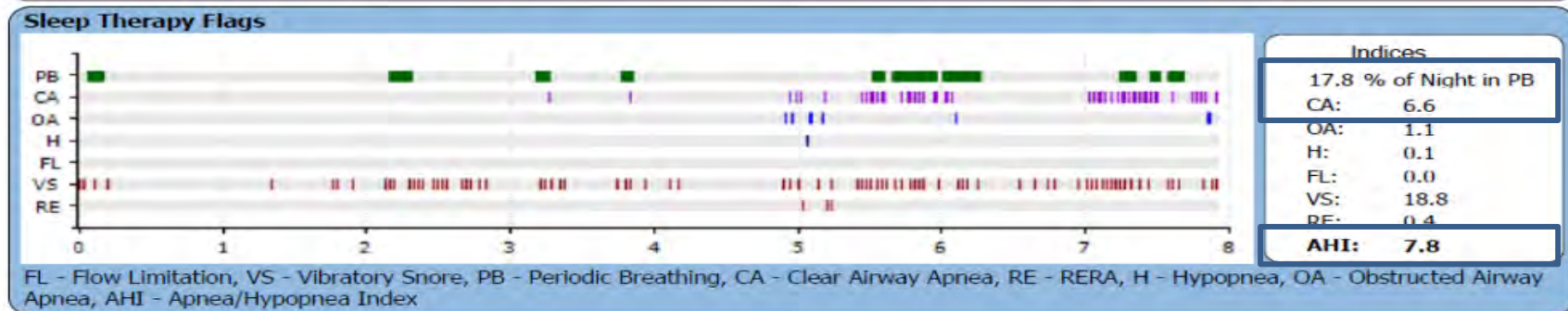
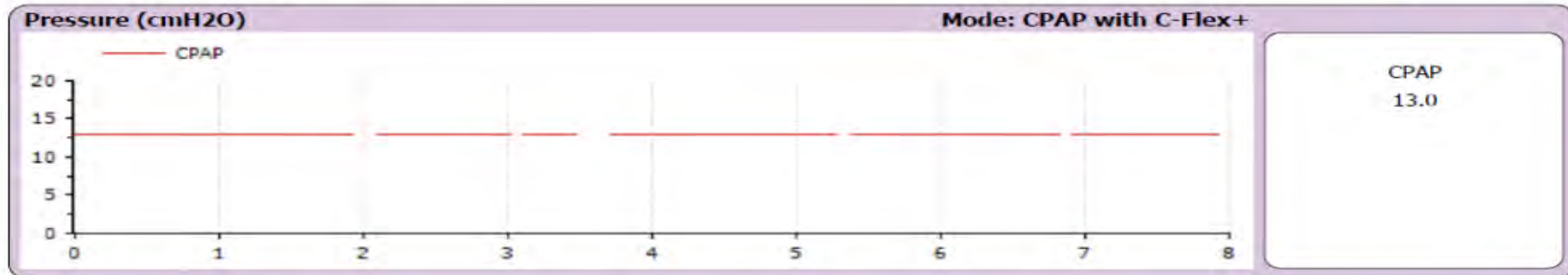


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Daily Details

12/7/2018 9:56 PM - 12/8/2018 5:52 AM



CPAP downloaded data in conjunction with clinical information is useful as a tool for follow up patients with sleep disordered breathing

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