



neteera

## Medical & Wellness Deck

July 2020



Neteera | To “watch over”

Aramaic | Taken from the Babylonian Talmud



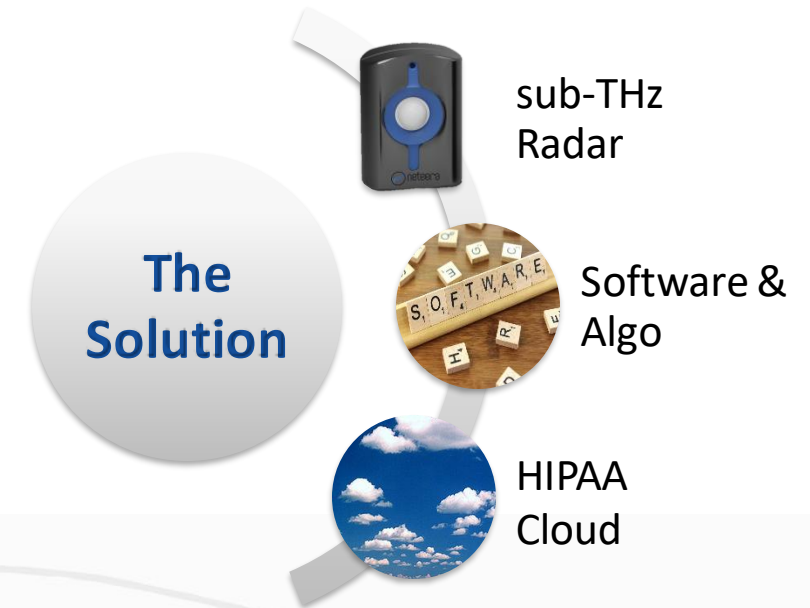
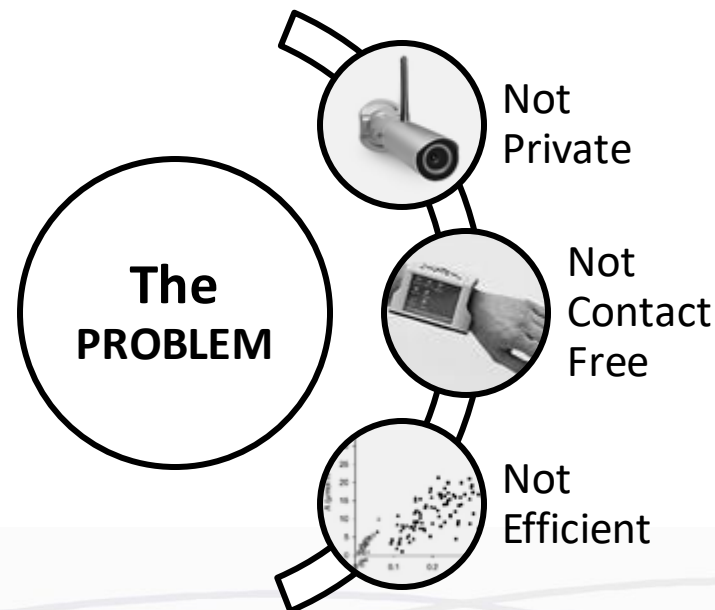
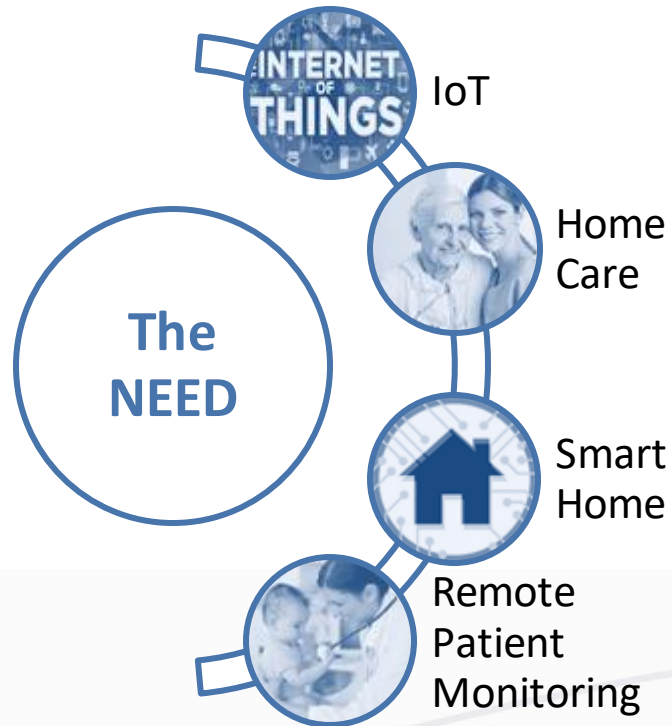
# Humans are the last wireless frontier



Our evolving world requires better human/machine interaction and sensing. This is a cornerstone of Healthcare, IoT and robotics.

Current solutions are not private (camera), require contact (wearables) or are inefficient (low frequency radars).

***Neteera's solution –  
sub-THz radar, algo & SaaS.  
We solve the challenge with deep  
tech & business expertise.***

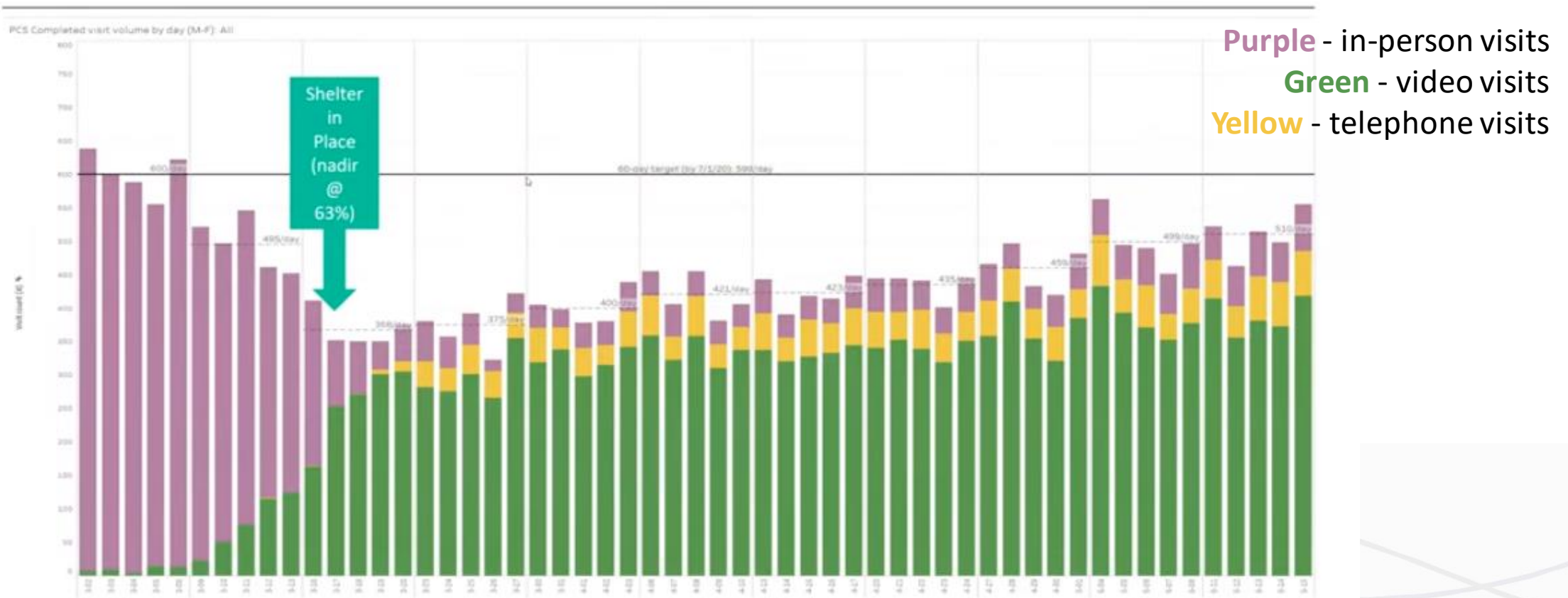


# Telehealth and RPM – Pre-COVID-19



Historically virtual care has been 1% of all visits, in 4 weeks that's grown to 30% and has stabilized.

## Virtual Visit Growth



# The “Care” Problem



## The Problem:

### Review of Systems:

Constitutional: No fatigue, F/C/S  
HEENT: Neg  
Pulmonary: No cough, SOB  
Cardiac: As above  
GI: No GI distress, nl appetite, nl BMs  
Musculoskeletal: No soreness  
Endocrine: No heat or cold intol

### Physical Exam

There were no vitals taken for this visit.

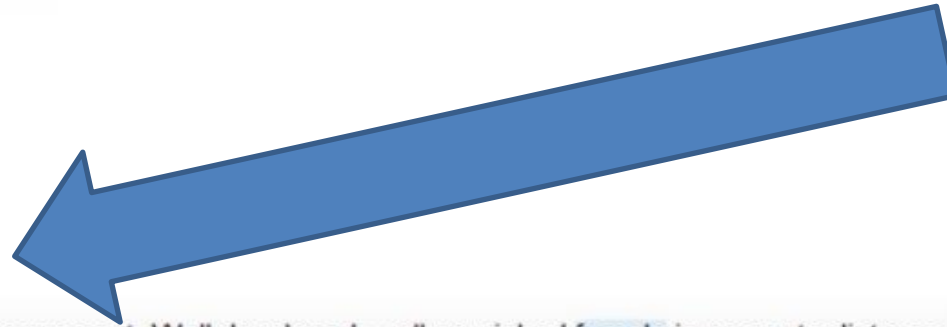
**General appearance:** Cooperative and conversant. Well developed, well nourished female in no acute distress.

**Oropharynx:** Clear, mucuous membranes moist.

**Neck:** No jugular venous distention.

**Lungs:** Normal respiratory effort. Clear to auscultation bilaterally. Good air movement. No wheezes, crackles, or rhonchi.

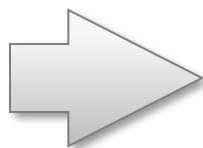
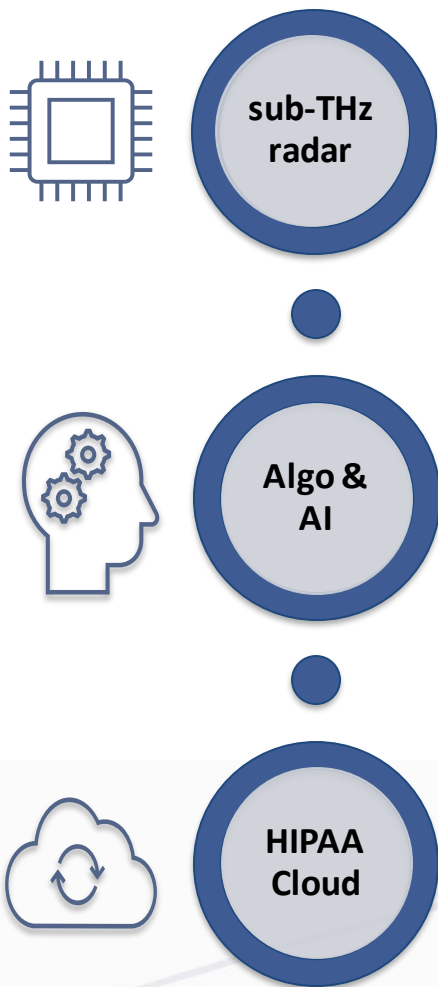
**Heart:** Regular rate and rhythm. Normal S1 and S2. \*\*\* No murmurs, rubs, or gallops. No heave. PMI normal in size, location, and intensity.



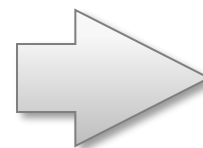
# Evolved radar tech



## Core Tech



5cm X 7cm



## Current Capabilities

### Sensing ***Vital Signs*** through clothing



➤ Heart Rate (Pulse)



➤ Respiration Rate (RR), I:E ratio



➤ Heart Rate Variability (HRV)



➤ Respiration Amplitude (RA)

### Planned and under work Features :

Cough

Tidal Volume

Shivering Detection

Stroke Volume (cardiac output) –  
(medium probability)

Motion & Speech

Atrial Fibrillation

SpO2 & Temperature (with Valeo)

RRV

Demographics (with Valeo)

Blood Pressure



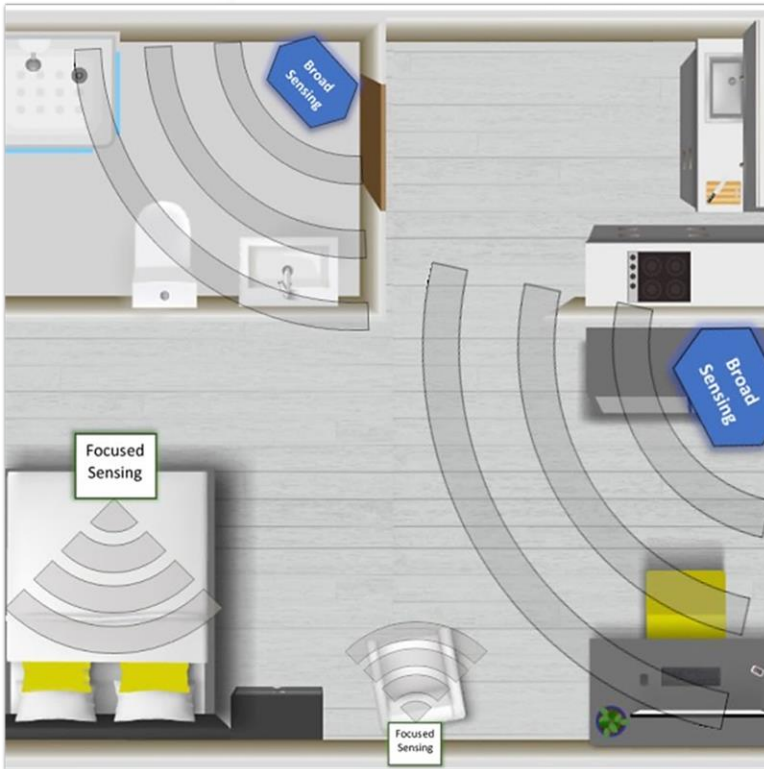
# GUI



# Use Case Examples



## Tech Pros



Occupancy, presence,  
activity monitoring



Sensing Through  
Clothing & Materials



Contact Free



Heart Rate & HRV



Respiration Rate and  
Depth



No Privacy or Safety  
Concerns

## Use Case Examples

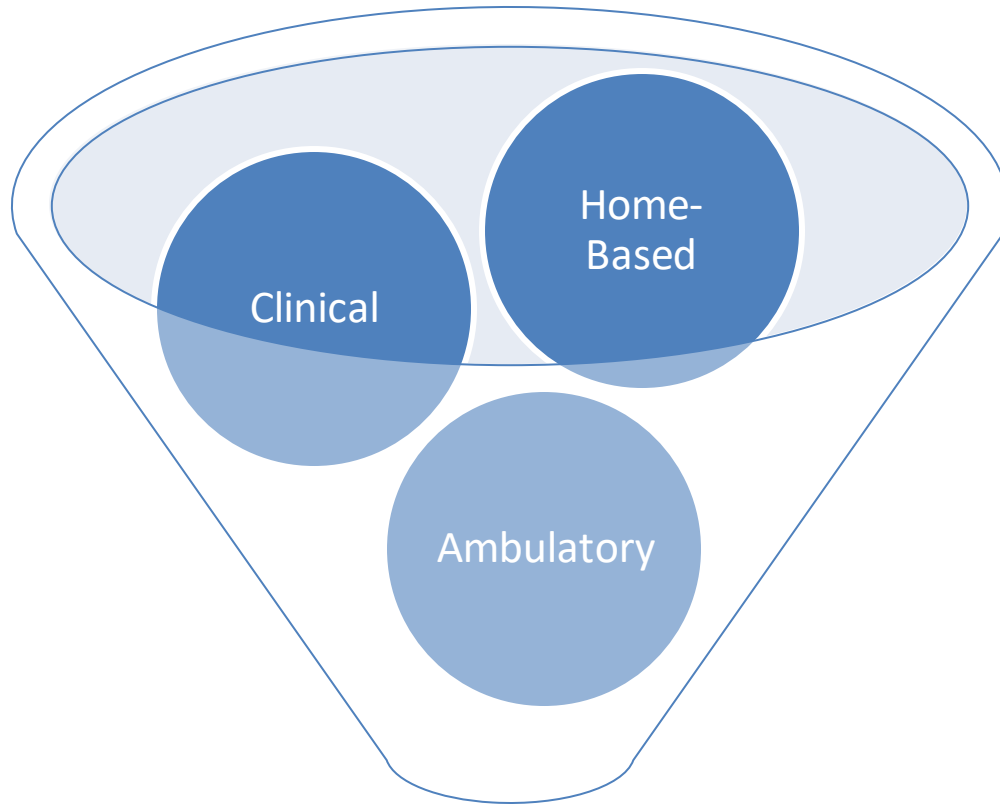
Hospital / Clinical  
monitoring

RPM

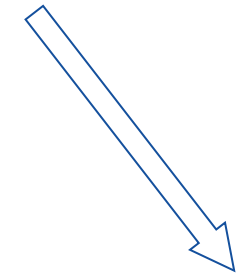
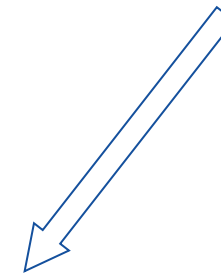
Telemedicine

Workplace monitoring

# Capture Clinical Data at Multiple Points of Care



**Health status, trends,  
insights and interpretation**



**“Common”  
Vitals  
(RR, RA, HR,  
HRV)**

**“Lab” Vitals  
(I/E, RRV,  
Tidal Volume,  
Stroke Volume)**



# Real Deployments of Operational System



Clinical Setup @ Northwell Health Sleep Lab  
System Installed Under Mattress



System Measures  
50mm x 70mm x 30mm

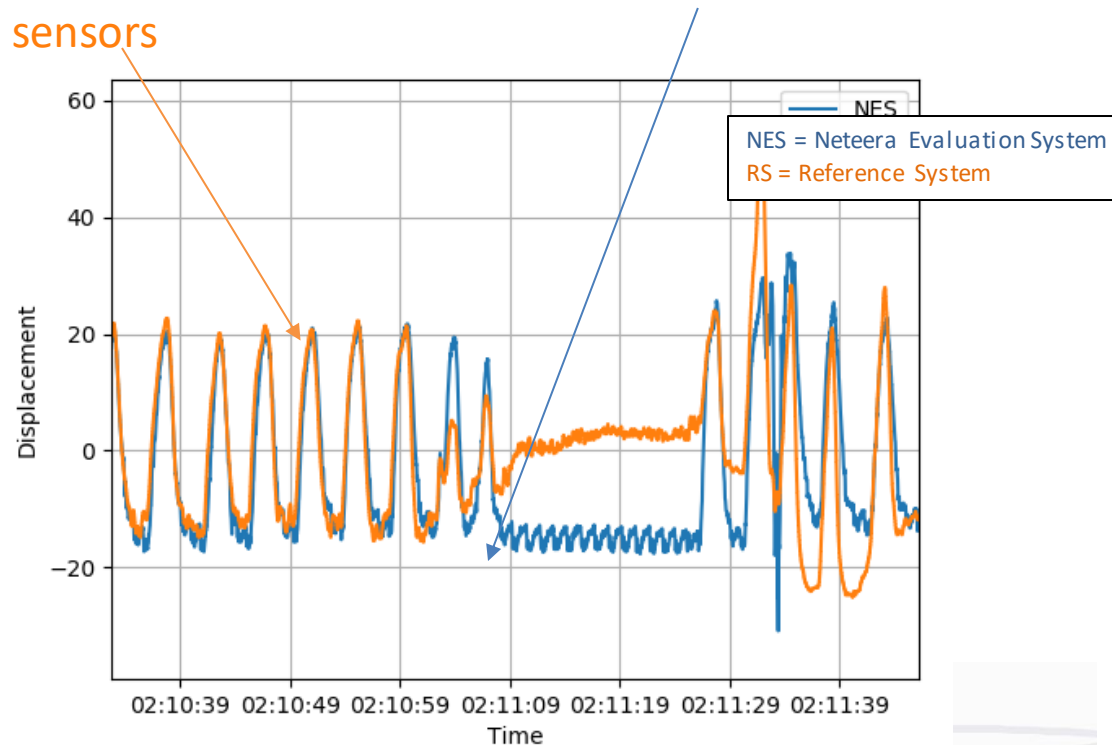


# Clinically Validated & Accurate Sensing Platform



Clinical  
Polysomnography  
EKG and Respiratory  
sensors

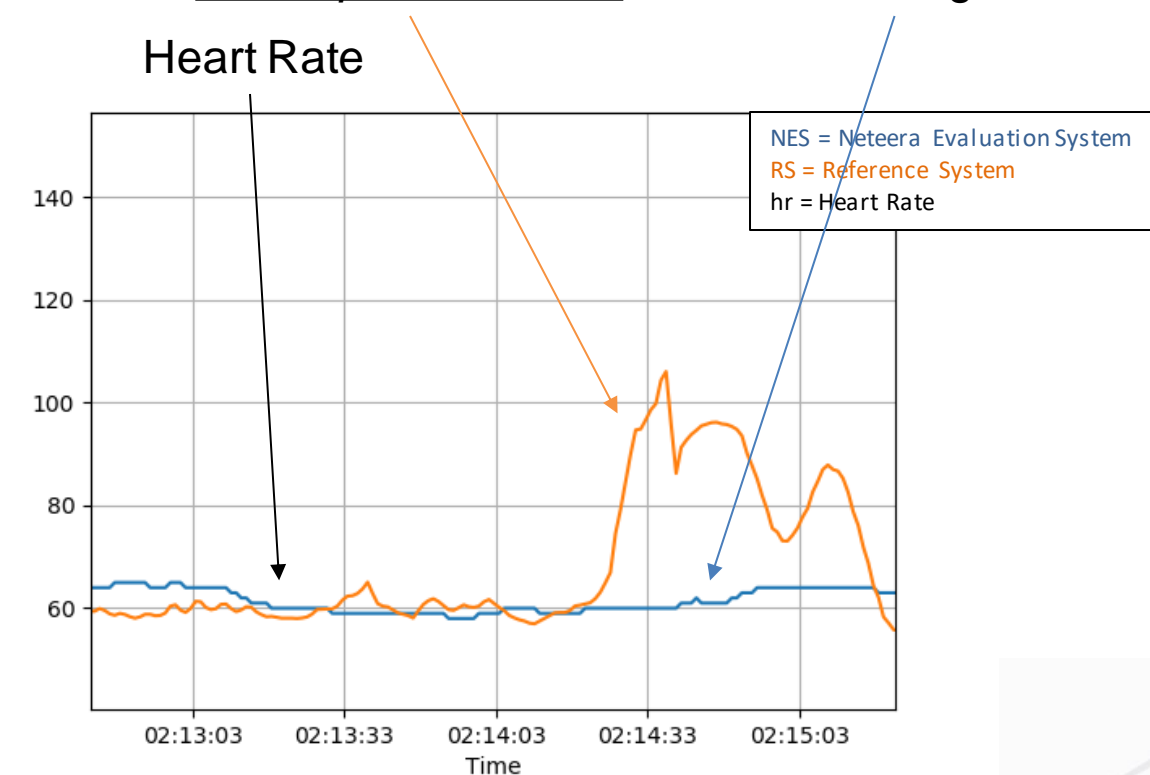
Neteera's sensor collects both  
respiration and heart rate signals



Clinical study (Northwell Health) shows full  
alignment with FDA reference sensor for  
Sleep Apnea events and vital signs

ECG Loses Signal  
due to patient motion

Neteera Maintains  
Normal Signal



Clinical study (Northwell Health) shows  
superior performance of Neteera's sensor  
in presence of motion

# NWH-Neteera – Clinical Study Summary



- A total number of 23 subjects with 1920 apnea events were analyzed. 2019.
- Sensor was upgraded after 1<sup>st</sup> batch, Software was upgraded after 2<sup>nd</sup> batch

Session	hypopnea	obstructive	Central	Mixed	Success Rate
1 <sup>st</sup> batch (7 subjects)	284 events 85% success	354 events 79% success	8 events 88% success	N/A	646 events 82%
2 <sup>nd</sup> batch (9 subjects)	608 events 88% success	420 events 93% success	51 events 98% success	65 events 100% success	1144 events 91%
3 <sup>rd</sup> batch (7 subjects)	76 events 93% success	33 events 100% success	20 events 100% success	1 events 100% success	125 events 96%
<b>Total</b> (23 subjects)	<b>997 events</b> <b>88% success</b>	<b>809 events</b> <b>88% success</b>	<b>82 events</b> <b>98% success</b>	<b>66 events</b> <b>100% success</b>	1920 events 88%

# Clinical grade performance and qualification roadmap



## Heart Rate Performance

	HR Actual %	HR Targets %
±5bpm	94	97
±5%	91	95

## Respiration Performance

	RR Actual %	RR Targets %
±2bpm	90	95
±10%	87	95



ISO-9001 – quality management and ISO's best-known standards.

**Received June 2018**



ISO-13485 – medical device design, production and installation certification

**Received March 2020**



FDA – 510(k) Class 2 – Premarket Notification Process to achieve faster path to FDA

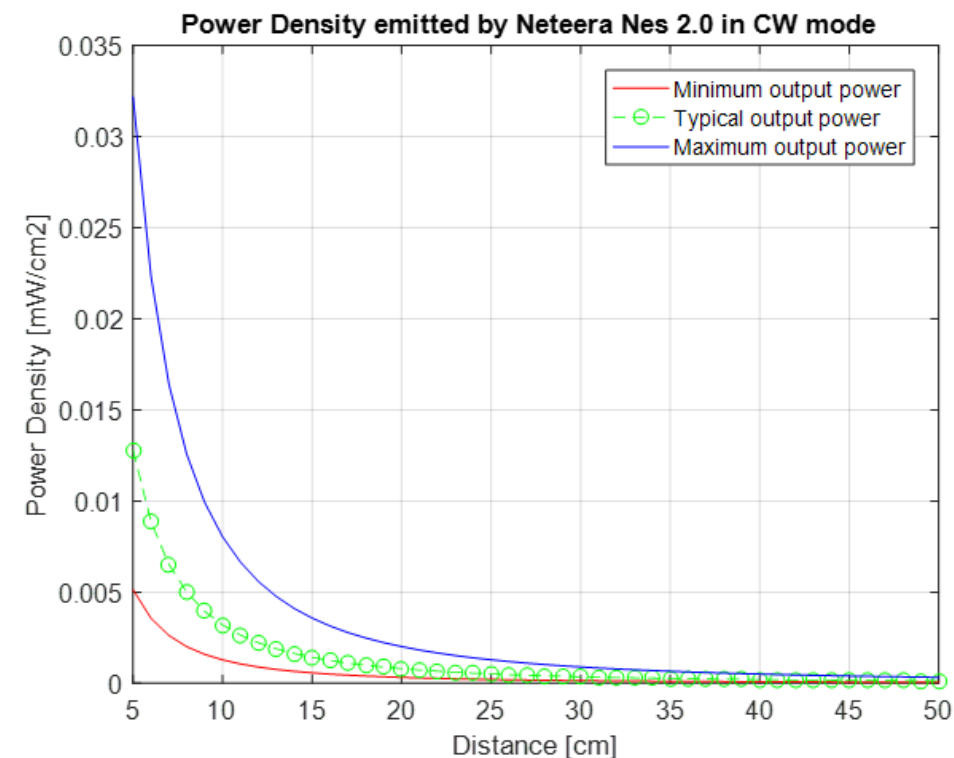
**Expected 1Q21** – May be delayed due to health crisis

# Safety of Neteera's radar



Country	Guidelines	PD restrictions For General Public (mW/cm <sup>2</sup> )	Frequency Range (GHz)
European Countries	ICNIRP-(1998) [4]	1	2-300
United States	FCC-(1996) [2]	10	15-300
IEEE	IEEE Std C95.1™ - 2005 [5]	1.99	100-300

- Our sensor emits less than 3% of the maximal power density restrictions, according to all standards
- Validated by an independent, third-party lab (Hermon Labs)





# Technology Enabled Analytics - Roadmap



2018-2019

2020-2021

2022-2023

Hardware

FMCW Single P2P  
sub-THz Micro-Radar

FMCW/CW AEC-Q100 P2P  
sub-THz Micro-Radar

Multi Fixed beam  
sub-THz Micro-Radar

Software

Motion & Vibration  
Compensation

Real-Time Data  
Interpretation

Cloud Database +  
API to Electronic  
Medical Records

Predictive  
Data Interpretation

Available  
Metrics

HR

RR

HRV

RA

Motion



Respiration  
Variability

Tidal  
Volume

Blood  
Pressure

Multiple  
Subject  
Mapping



Motion/  
Classification

Bio-ID

Position  
+ Posture



Clinical  
Traction

Clinical Research

Sleep Lab

Clinical Trials

Telemedicine

Cardiac Output  
Emergency Medicine

Clinical Roll Outs

Certifications

