## ASX Announcement



Medibio Limited – 11 SEPTEMBER 2017

#### COMPANY UPDATE

Sydney, Australia and Minneapolis, MN – 11 September 2017: Medibio Limited (MEB or the Company)(ASX: MEB)(OTCQB: MDBIF), a digital health company that has developed an objective testing system to assist in the screening, diagnosis, and treatment effectiveness of depression and other mental health disorders, is pleased to release a company update presenttion, which is attached to this announcement. The presentation will be used in upcoming investor road show meetings and in meetings with prospective customer partners and government entities, including multiple Departments of Veterans Affairs agencies.

#### **INVESTMENT HIGHLIGHTS**

- Large, Underserved Markets in Mental Health
- Superior Solutions to Care by Delivering Objective Data
- Completed Clinical Validation Studies
- FDA Confirmatory Study in Progress
- Patented Panel of Biomarkers
- New Executive Leadership and Board
- Multiple Applications in Large Market Verticals

#### About Medibio Limited

Medibio (ASX: MEB) (OTCQB: MDBIF) is a digital health company that has pioneered the use of objective biometrics to assist in the diagnosis and treatment of depression and other mental health disorders. Medibio's proprietary Digital Mental Health Platform uses advanced, cloud-based analytics to enable GPs and mental health clinicians to cost-effectively screen, precisely diagnose, and objectively confirm treatment effectiveness to better manage patients. Medibio's technology also provides an objective method for the assessment of stress and mental well-being that can be translated to the non-medical workplace stress/well-being, wearable technology, and app markets. The company was founded in Australia, with offices located in Melbourne (Vic), and U.S. offices in Minneapolis, MN and Palo Alto, CA. Medibio is listed on the Australian Securities Exchange Ltd and trades on the OTCQB Venture Market www.otcmarkets.com and www.asx.com.au.

To learn more about Medibio visit <u>www.Medibio.com.au</u>

– ENDS –

Page 1 of 2

Further Information:Website:	www.medibio.com.au		
Medibio Shareholder Enquiries:	Australian Media Enquiries:		
Jack Cosentino	Peter Taylor		
CEO and Managing Director	NWR Communications		
Medibio Limited	peter@nwrcommunications.com.au		
jack.cosentino@medibio.com.au	T: +61 (0) 412 036 231		
T: +1 (952) 465 4787			



INNOVATION IN MIND

## Investor Presentation September 2017

ASX: MEB OTCQB: MDBIF

© Medibio Limited 2016

#### DISCLAIMER

## FORWARD LOOKING STATEMENTS

The purpose of the presentation is to provide an update of the business of Medibio Limited (ASX:MEB) (OTCQB: MDBIF). These slides have been prepared as a presentation aid only and the information they contain may require further explanation and/or clarification.

Accordingly, these slides and the information they contain should be read in conjunction with past and future announcements made by Medibio Limited and should not be relied upon as an independent source of information. Please contact Medibio Limited and/or refer to the Company's website for further information. The views expressed in this presentation contain information derived from publicly available sources that have not been independently verified.

None of Medibio Limited, or any of its affiliates or associated companies(or any of their officers, employees, contractors or agents (the Relevant Persons)) makes any representation or warranty as to the accuracy, completeness or reliability of the information, or the likelihood of fulfilment of any forward looking statement or any outcomes expressed or implied in any forward looking statements.

Any forward looking statements in this presentation have been prepared on the basis of a number of assumptions which may prove incorrect and the current intentions, plans, expectations and beliefs about future events are subject to risks, uncertainties and other factors, many of which are outside Medibio Limited's control. Important factors that could cause actual results to differ materially from assumptions or expectations expressed or implied in this presentation include known and unknown risks.

Because actual results could differ materially to assumptions made and Medibio Limited's current intentions, plans, expectations and beliefs about the future, you are urged to view all forward looking statements contained in this presentation with caution. Except as required by applicable law or the ASX listing rules, the Relevant Persons disclaim any obligation or undertaking to publicly update any statements in this presentation, whether as a result of new information or future events.

This presentation should not be relied on as a recommendation or forecast by Medibio Limited. Nothing in this presentation constitutes investment advice or should be construed as either an offer to sell or a solicitation of an offer to buy or sell shares in any jurisdiction. COMPANY VISION & OVERVIEW

We **envision** a world where everyone is empowered to be mentally well.

**Medibio** is a **Digital Mental Health Pioneer** that has developed a proprietary objective system for screening, diagnosing, monitoring and management of depression and other mental health disorders COMPANY HIGHLIGHTS

**3 Clinical Studies Completed** (Depression/ PTSD)

**FDA Confirmatory Study in Progress** (Depression)

New Executive Leadership & Board

**Commercialization Pathway** Consumer & Medical Markets

Australia's Biggest Mental Health Check-In Campaign Annual Program - Vital Conversations

Developing Industry's First Standardized Mental Health Score



#### WHY INVEST

#### **DEPRESSION IS A GLOBAL EPIDEMIC AFFECTING 350M** Less than 10% of patients receive optimal care

SUBJECTIVE DATA DRIVING UNDER DIAGNOSIS Nearly 70% of diagnosis are made by under-qualified GPs

#### PERSONAL MAXIMIZATION MEGA-TREND IN HEALTHCARE

69.1M wearable health and fitness trackers were sold in 2016

#### PIONEERING CARE BY DELIVERING OBJECTIVE DATA

Developed the objective testing system to diagnosis depression and other mental health disorders

#### PATENTED PANEL OF BIOMARKERS

Leveraging autonomic, circadian and sleep biomarkers to objectively characterize broad spectrum mental illness

#### CLOUD-BASED PLATFORM ABLE TO OPERATE ON ANY SYSTEM

System and device agnostic - cost-effective delivering information to any healthcare provider or consumer anywhere

#### WHY INVEST NOW?

**SUPERIOR VALUE PROPOSITION** - Objective diagnosis, treatment efficacy confirmation and data-driven patient management

**CLINICAL VALIDATION STUDIES WITH LEADING RESEARCH INSTITUTIONS** - Johns Hopkins, Mayo Clinic, Emory University, Ottawa University, BMRI

#### **REGULATORY APPROVALS UNDERWAY**

- FDA clearance and CE Mark approved

### PARTNERS ACROSS VERTICALS WITH HIGH INTEREST TO COMMERCIALIZE

- Partnership opportunities under consideration include Wearables, Sleep Analysis and Treatment, Digital Health and Telepsych

## THE REASON WHY **PREVALENCE**

with Mental Health Diagnosis

**350 MILLON** suffer from depression

> lin 13 suffer from anxiety

27

**ADULTS IN EUROPE** 

26%

Leading cause of disability in the US

• NIMH <u>article</u>

 World Health Organization. (WHO 2011a). Global status report on non-communicable diseases 2010. Geneva: WHO World Mental Health Day 2015 **7.7M** PTSD sufferers in the United States alone, or, **3.5%** of the population

**21M** Suicide attempts from Mental Illness

#### THE REASON WHY SUB-OPTIMAL TREATMENT

## OUT OF 350 MILLION

patients globally

# < 7% total

receive optimal treatment

## **ONLY 50%**

are ever diagnosed (Gonzalez, 2010)

SCREENING

**30%** are incorrectly diagnosed

(Angst, 2011)

DIAGNOSIS

20% receive optimal treatment (Barbui, 2006)

TREATMENT

LEVERAGING PERSONAL MAXIMIZATION OF THE MEGA-TREND IN WELLNESS & HEALTHCARE

#### CONSUMER unregulated

- Screening
- Risk Stratification
- Wellness Scoring
- Wellness Monitoring

#### MENTAL WELLNESS



#### MEDICAL regulated

- Pre-Screening
- Differential Diagnosis
- Treatment Adherence Tracking
- Treatment Efficacy Monitoring

#### MENTAL ILLNESS

We use the body's biometric data to objectively measure mental health.



#### 9

#### CONSUMER INNOVATION

#### **BIOMETRIC DATA**

(Wearable Device)



Wearable Device Agnostic approach



MENTAL WELLNESS MONITORING

52

WELL

DISTRESSED

MEDICAL INNOVATION

11

**BIOMETRIC DATA** (ECG, EEG, ACTIGRAPHY)



Medical Device Agnostic approach



#### CONDITIONS

Cover Mental Health Spectrum

Major Depression Disorder (MDD) Generalized Anxiety Disorder (GAD)

Post Traumatic Stress Disorder (PTSD) Schizophrenia Disorder Bipolar/Unipolar Disorder STATE OF THE ARCHAIC NOT STATE OF THE ART

#### **Today's Approach** *Subjective Measures*

NAME:

Symptom-based Diagnosis Screeners:



# DATE: nns: TOTAL: Not difficult at all Somewhat difficult Very difficult Extremely difficul

**PATIENT HEALTH QUESTIONNAIRE (PHQ-9)** 

ften have vou beer

...d by Drs Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke, and colleagues, with an information, contact Dr Spitzer at ris8@columbia.edu. Use of the PHQ-9 may only be made in at http://www.pfizze.com. Copyright G1999 Pitzer Inc. All rights reserved. PRINE MD TODAY is a total right.

#### BRINGING OBJECTIVITY TO MENTAL HEALTH

#### Today's Approach Subjective Measures

Symptom Based Diagnosis Screeners:

- DSM-5
- PHQ-9
- GAD-7
- GHQ-12
- PC-PTSD
- MDQ / MSS

#### Medibio Data Objective Measures

Biometric Markers:

- Circadian Heart Rate
- Sleep Cycles
- Autonomic System
- Actigraphy

OBJECTIVE DATA TO DRIVE CLINICAL OUTCOMES

#### Today's Approach Subjective Measures

Symptom Based Diagnosis Screeners:

• DSM-5

- PHQ-9
- GAD-7
- GHQ-12
- PC-PTSD
- MDQ / MSS

#### Better Screening

Better **Diagnoses** 

Better Treatments

Better Monitoring

Better Outcomes

Medibio Data Objective Measures

#### Biometric Markers:

- Circadian Heart Rate
- Sleep Cycles
- Autonomic System
- Actigraphy

PATIENT JOURNEY

Early Detection by Primary Care Physician

Treatment

Maintenance

#### **MONITOR & EVALUATE**

Outcome(s)

#### SCREENING

#### MEDIBIO-ID

Direction of Psychiatric Condition

#### DIAGNOSIS

AND PREDICTIVE ANALLIC

0

MEDIBIO-DX

Objective Biomarkers Guide Diagnosis

#### TREATMENT

#### MEDIBIO-RX

- Confines Therapy Effectiveness -Drug Selection and Titration
- Frequent monitoring provides early detection of ineffective protocols

**MARKET VERTICALS\*** 

#### **PRIVATE INSURANCE &** WOMEN'S HEALTH **PRO & COLLEGE ATHLETES AGING HEALTH CORPORATE WELLNESS** 97.7M Adult Women **3M Active & Retired** 46M Age 65+ 1 in 8 Suffer Depression 133.6M Covered Lives 24% Females - MH Issues 20% Suffer Mental Disorders 1 in 9 Suffer Anxiety \$8.0B Wellness Spending 18% Males - MH Issues **11% Suffer Anxiety VETERANS ACTIVE MILITARY PRIMARY CARE & ADOLESCENT'S HEALTH ADMINISTRATION DEPT OF DEFENSE PSYCHIATRY PHYSICIANS** 41.7M Age 12-17 1.4M Active Enlisted 44.2M Annual Physicals 9.1M Covered Lives 31.9% Suffer Anxiety 25% MH Issues 20.0% Suffer Mental Disorders 20.0% Suffer MDD/PTSD 13.8 Considered Suicide **11% Multiple Diagnosed Conditions** 11% Suffer Anxiety

\* Facts and figures represent US market only, does not include other global markets.

#### REVENUE OPPORTUNITIES



Report Generated (\$15-\$20 per report)





Patient Screening Risk Stratification

MEDIBIO-ID

Decision Support Tool Monthly Specialist Visit

MEDIBIO-DX



Patient Management Pharma prescription management

MEDIBIO-RX

**Predictive Population Management** 

Insurance Company/ Government Pharma

#### PATH TO REVENUE

Current primary care screening environment alone presents an **\$875M** opportunity. Another **50%** of population are unscreened. This test will be as common as taking a patient's vital signs.



Does **not** include treatment, prevention, medication management, data, as well as all other market (paediatric and adolescent) and applications of our system.

#### OUR MILESTONES

TIMING	MILESTONE					
Q4, 2016	Pilot Study Validation Johns Hopkins University (Major Depressive Disorder n=20)	-				
Q1, 2017	Strategic Research Partnership - Emory PTSD					
Q2, 2017	Completion of John Hopkins University Validation Study (Major Depressive Disorder n=60) Publishing of Peer-reviewed paper - Emory University (PTSD)					
Q3, 2017	<b>Presentation of independent paper - University of Ottawa (Major Depressive)</b> Announcement of results from the John Hopkins University Exploratory Study (Major Depressive Disorder n=60). Commencement of Confirmatory Study to provide data for FDA Submission (n=200)	-				
Q3, 2017	Agreement with FDA on subject numbers required for depression confirmatory study Commencement of Confirmatory Study to provide data for FDA Submission (n=200)					
Q4, 2017	CE Mark submission (Platform, Major Depressive Disorder diagnostic aid) QMS Audit for CE Mark					
Q1, 2018	CE Mark and QMS approval (Platform, Major Depressive Disorder diagnostic aid)					
Q2, 2018	FDA submission (Major Depressive Disorder diagnostic aid)					

#### CORPORATE STRUCTURE

#### CAPITAL STRUCTURE (ASX:MEB)(OTCQB:MDBIF)

(amounts shown in AUD\$)

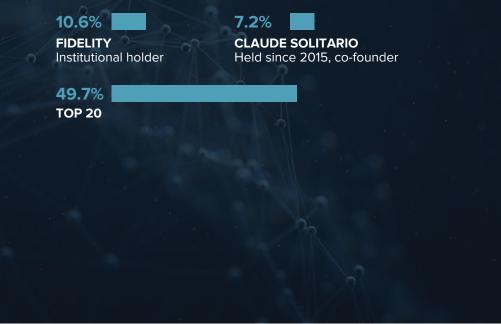
Market Cap Share Price as of 31 August 2017 Shares on Issue	<b>\$53.7M</b> \$0.36 149.0M
Market Cap (fully diluted) Share Price as of 31 August 2017	<b>\$62.5M</b> \$0.36
Fully diluted shares (per August 29, 2017 Appendix 3B)	173.7M

**Cash Available** 

#### \$10M

(June 30, 2017 cash balance plus \$5M anticipated inflow over 9 months from R&D rebate, stock option exercise, & partly paid shares)

#### SUBSTANTIAL SHAREHOLDERS



#### COMPANY OUR BOARD



#### CHRIS INDERMAUR

Chairman Seasoned ASX Chair **DR. ADAM DARKINS** Deputy Chairman (Incoming Chairman)

Telehealth Icon

#### DR. FRANKLIN PRENDERGAST Non-Executive Director Healthcare Luminary



MICHAEL PHELPS Non-Executive Director World Class Athlete and Mental Health Advocate



#### PATRICK KENNEDY Non-Executive Director Former US Congressman and Mental Health Advocate

KRIS KNAUER Non-Executive Director Investor



ANDREW MAXWELL Non-Executive Director Former Biotech CEO



JACK COSENTINO CEO/Managing Director

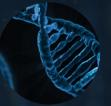
# 

INNOVATION IN MIND

## Addendum

HALL.

Current diagnostic tests rely on clinical interviews with subjective interpretation



#### **OUR SOLUTION**

Quantitative and objective diagnostic based on biomarkers



Concordance rates near **70% for psychiatrists** and **33-50% for primary care physicians** 



**Repeatable, reliable test** with demonstrated classification accuracy of >80%



No objective measure of treatment effectiveness leads to long titration cycles

leads to long titra



The standard of care is assessment by a primary care physician > **Higher cost due to misdiagnosis** 



Provides **objective indication of treatment efficacy** enabling time to optimal treatment

**Cost-effective, scalable solution** that can be administered at the primary care or specialty level > more reliable, repeatable and low cost OUR IMPACT

## **CONTINUUM OF CARE**



Apple Watch, etc. Integrated Mental

Health System

Primary Care Physicians Standard Screener

Communities of Interest VA, DOD, NIH, NIMH Standard Screener

Psychiatrists/ Psychologists Improved Diagnostic Accuracy Pharmaceuticals Improves Patient Experience Adherence & Treatment Efficacy

> Telehealth Platforms Medibio System Integrations

> > Corporate Wellness Home Test & Medication Management

Reimbursement for Improved Health Score





# **Vital** Conversations

## Medtronic

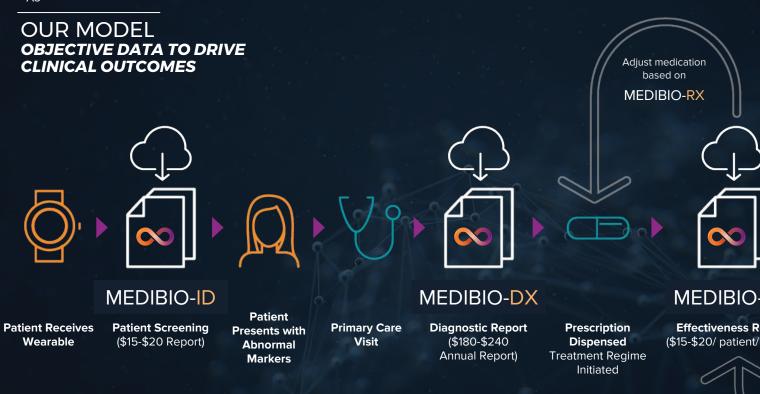


#### **EMORY** UNIVERSITY





JOHNS HOPKINS HEALTH SYSTEM



#### **MEDIBIO-RX**

**Effectiveness Report** (\$15-\$20/ patient/ month)

$\rightarrow$		+-
=	-	Ξ
=	Ξ	$\equiv ($
	_	_

**30 DAY** Follow-Up Program

#### SIGNIFICANT VALIDATION SUPPORTING TECHNOLOGY

STUDY OUTLINE	PARTNER
<b>DEPRESSION</b> Retrospective Study, 889 patients (2 Nov 2016)	OTTAWA UNIVERSITY
<b>DEPRESSION</b> Prospective Study, 26 patients (21 Dec 2016)	JOHNS HOPKINS
<b>DEPRESSION, ANXIETY DISORDER, SCHIZOPHRENIA</b> Various historical studies (Medibio)	PEER REVIEWED
<b>SLEEP STAGING USING ECG DATA:</b> 7500 patients completed 24 June 2016	JOHNS HOPKINS
	<ul> <li>DEPRESSION Retrospective Study, 889 patients (2 Nov 2016) </li> <li>DEPRESSION Prospective Study, 26 patients (21 Dec 2016) </li> <li>DEPRESSION, ANXIETY DISORDER, SCHIZOPHRENIA Various historical studies (Medibio) </li> <li>SLEEP STAGING USING ECG DATA:</li> </ul>

Versus 33-50% - Diagnostic accuracy in the Primary Care Setting<sup>(1)</sup>

(1) Depression in Primary Care Vol. 1: U.S. Department of Health

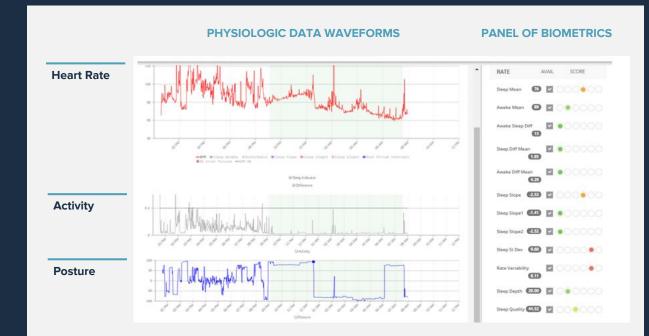
#### BIOMARKER BASED ON OBJECTIVE DIAGNOSIS

#### APPROACH

Panel of circadian, sleep and automatic system biomarkers enables automated, repeatable, and objective characterization of the impact of mental illness on physiologic state

Johns Hopkins University Case Study: **Patient with MDD** 

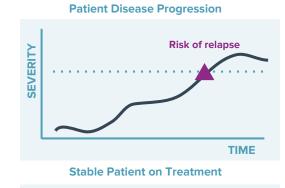
The heart-rate morphology, rate variability and overall sympathetic tone are indicative of the presence of depression.



#### DATA DRIVEN PATIENT MANAGEMENT

#### **Patient Panel Enables Early Identification of At-Risk Patients**

Dashboard Scars	50 <b>v</b>							Traine
* Expert Rater	*	REVIEWED	= SCAN & USER ID	PARTNER	START TIME	DURATION	RESULT	TIONS
FINE.	\$	0	ID: 5902601bba0118575256a48c Der Ib teinhibtionttorenteil	MEB632IA2	2016-12-19 15:30:22	29:07		
Unapproved	\$	0	ID: 5902bea8ba0118575280018e Var ID: Ste23/ISBa08/US/22char8	MEB6323A2	2016-08-11 10:52:21	28:45	-	B Report lat Details
Favourites	\$	0	ID: 59195445250109367c397c8c	MEB632DBL	2016-12-06 07:36:09	28:22	Very Severa	Billippert ad Details
A0	\$	0	ID: 5919559d250109367c3b1764 Gar ID: 591903128r38b2c3e124	ME5632DBL	2017-02-24 09:47:35	28:17	-	Billippert 🖉 Details
	\$	0	ID: 59195201250109367c393612 Uwi to tenthistoroida/carcalle	MEB632JHU	2017-03-22 16:22:01	28:05	-	B Report int Details
	\$	0	ID: 5919548(2501093b7c39%7) Unit D: 59154c250108(h)(9824	M68632D8L	2016-12-21 14:49:34	28:05	-	B Report of Details
	\$	•	10:59194d7250109367c354654 Get 0:10194ac2010801351ad	MEB632JHU	2017-03-08 10:37:56	27:58		Billippert of Details
	¢	0	ID: 59194c562501093b7c345620 Uwr ID: 59194c562501093b7c345620	MEB6320HJ	2017-02-27 14:50:15	27:57	-	B Report int Details
	\$	0	40: 5902be296a01857527e6118 Uni 10: 15e23808e011-20:465	MEB632142	2016-08-01 11:19:16	27.54	-	B Report of Details
	\$	٥	ID: 59194d03250109367c355d96	WEB625H0	2017-04-24 08:44:07	27:14		Report and Ortality





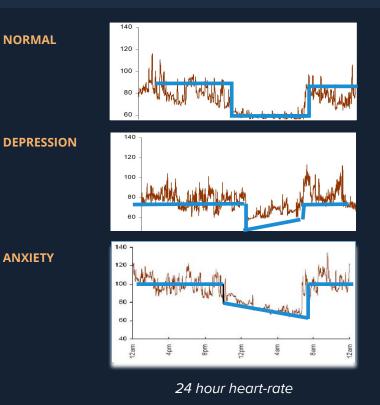
#### A8

#### OVERVIEW OF COMPLEMENTARY/ COMPETING TECHNOLOGIES

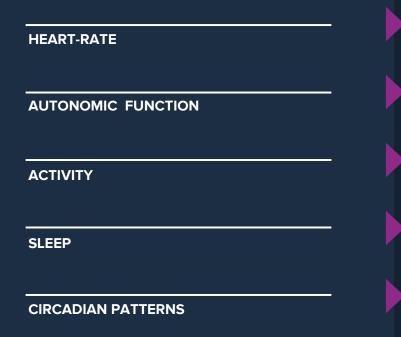
TECHNOLOGY	DESCRIPTION	FDA	DIAGNOSTIC ACCURACY	EQUIP COST	TEST COST
Medibio	Autonomic Nervous Dysfunction, circadian and sleep biomarker-based test	Under Way	80-90% - based on in excess of 4000 data points	\$30	<\$100
Blood Test	Ridge Diagnostics offer an MDD score of 1 to 10 based on the analysis of 9 blood markers	No	80-90% - based on a pilot study with 79 participants	n/a	\$800
EEG	Johns Hopkins research using full EEG's to discriminate between depressed and non-depressed	Νο	80% based on a pilot study with 30 participants	\$30,000	\$600
EVG	ElectroVestibuloGraphy measurement of the inner ear taken in a specialty designed tilt chair	Νο	77-87% - based on a pilot study with 74 participants	\$10,000	>\$300
Saliva and Hormone Tests	Cortisol and hormone tests mainly aimed at stress	No	For stress only	n/a	\$100-300
Clinical Psychiatric Diagnosis	1-3 hour consult done by a trained clinician (psychiatrist/ psychologist) using a structured instrument	Yes	70% concordance on the common disorders such as depression and anxiety	12 years of study	\$300-500

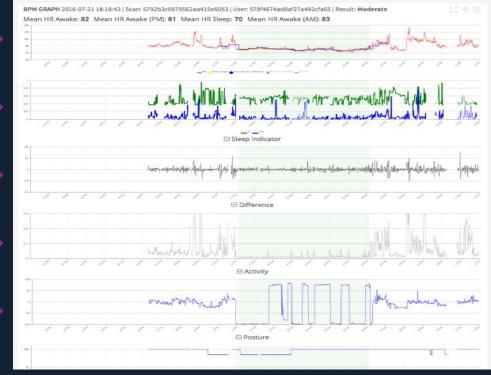
#### INSIGHTS BASED ON 15 YEARS OF CLINICAL RESEARCH

- Research initiated 15 years ago at University of Western Australia to test the theory that mental state is linked to autonomic nervous system (ANS), circadian and sleep disturbance
- Morphologic analysis of circadian heart rate waveforms (CHR) gives objective indications of 'core' physiological differences between different forms of mental illness such as anxiety and depression
- All serious mental illness (SMI) are associated with ANS and wider neuroendocrine dysregulation (especially affective disorders) and abnormalities in circadian regulation.
- Evidence of the state-dependent relationship between psychiatric status and CHR has come from serial monitoring of patients undergoing treatment – from individuals monitored days, weeks, months and years apart.



#### BIOMARKERS PROVIDE RICH CHARACTERIZATION OF MENTAL STATE

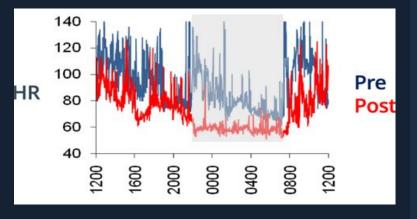




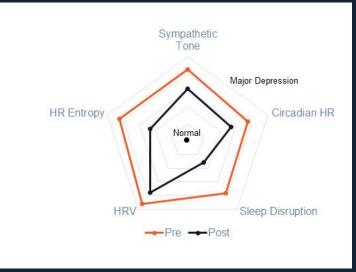
#### OBJECTIVE ASSESSMENT OF THERAPY EFFECTIVENESS

#### Case Study 1

- Individual diagnosed with Generalized Anxiety Disorder (GAD)
- Re-evaluated 10 days following effective psychotherapy treatment



#### **Biometrics normalize with effective treatment**



#### **DR. ADAM DARKINS**

"As Medibio's unique technology is maturing, it has the potential to support new models of mental health care that focus on wellness. By objectifying diagnosis and management to specifically address the rapidly growing health care needs of this population, business growth will be driven organically, and help transform mental health care delivery worldwide"

Dr. Adam Darkins, MD, MPHM, FRCS

#### DR FRANKLYN PRENDERGAST

"During my career at Mayo the key thing that stood out to me is that the mental health care system is broken. I joined Medibio because they have a tool that can address it""

Dr Frank Prendergast, M.D., Ph.D.

"I have personally experienced Medibio's technology and believe it can help make a profound impact in diagnosing mental health and empowering people to seek the help and support they may need"

**Michael Phelps** 

photo credit "Aqua Sphere"

A16

#### PATRICK KENNEDY

"I see a future where everyone who needs mental health care gets it. We must end the separate and unequal treatment of mental health and addiction, and ensure each of us is able to achieve a full, meaningful life."

Patrick Kennedy Founder, The Kennedy Forum photo : NBC News