CARDIAC RISK Profiler

Comprehensive Cardiac Risk Profiler & Analysis Device

With Patented Technology#

CARDIAC RISK Profiler
Tests and Interprets:

- Central Aortic Blood Pressure
- Carotid Femoral PWV (cfPWV)
- Augmentation Index
- Endothelial Function
- Heart rate variability of Sympathetic & Parasympathetic nervous system
- Cardiac Autonomic Neuropathy
- Lung Function

State- of- the- art PC based "CARDIAC RISK Profiler" provides an unparalleled screening &prognostic approach for clinicians in HTN/CVD/DM patients with a comprehensive report.

A single multi colour print report summarizes all the above mentioned tests along with interpretation . A colour coded bar graph in patient report indicates the overall health score of the patient .

A total of 50 plus Parameters are analysed and interpreted in the report for the clinicians perusal at a glance . Exhaustive clinical information with graphs of all tests parameters is also displayed and printed in the full disclosure report of 12 pages .

Heart Rate Variability assessment :

Hypertension is characterized by an increase in the LF component of HRV. Reduced parasympathetic activity is observed in hypertensive patients. Support the use of non-pathological therapy of hypertension that improves the vagal tone (eg, exercise) can be deduced by HRV analysis. It can also rule out risk in exercise.

Myocardial Infarction: Depressed HRV after MI may reflect a decrease in vagal activity directed to the heart, which leads to prevalence of sympathetic mechanisms and to cardiac electrical instability.
Depressed HRV is a powerful predictor of mortality and of arrhythmic complications (for example, symptomatic sustained ventricular tachycardia) in patients after acute MI. The rationale for trying to modify HRV after MI stems from the multiple observations indicating that cardiac mortality is higher among those post-MI patients who have a more depressed HRV. The inference is that interventions that augment HRV may be protective against cardiac mortality and sudden cardiac death. Assessment of HRV at both the early stage of MI (2 to 3 days after acute MI) and before discharge from the hospital (1 to 3 weeks after acute MI) offers important prognostic information. HRV measured late (1 year) after acute MI also predicts further mortality.

Myocardial Dysfunction : A reduced HRV has been observed consistently in patients with cardiac failure. In this condition characterized by signs of sympathetic activation such as faster heart rates and high levels of circulating catecholamines, a relation between changes in HRV and the extent of left ventricular dysfunction was reported.

Diabetic Neuropathy : In neuropathy associated with diabetes mellitus characterized by alteration of small nerve fibers, a reduction in time domain parameters of HRV seems not only to carry negative prognostic value but also to precede the clinical expression of autonomic neuropathy. saving you a lot of time. Additionally saving the patient multiple tests cost and inconvenience.

HRV Quantification with C-RAP device :

Short term HRV Parameters :

Three main spectral components are distinguished in a spectrum calculated from short-term recordings of 2 to 5 minutes. VLF, LF, and HF components. The distribution of the power and the central frequency of LF and HF are not fixed but may vary in relation to changes in autonomic modulations of heart period.
SDNN is Standard deviation of all NN intervals, SDANN is Standard deviation of the averages of NN intervals in all 5-minute segments of the entire recording and RMSSD is the square root of the mean of the sum of the squares of differences between adjacent NN intervals.

Dr. Ewing's Test Parameters :

ECG during deep breathing (E:I Ratio): R-R intervals during inhalation and exhalation are calculated. The longest R-R interval is determined during expiration (R-R max) and the shortest interval during inspiration (R-R min). The ratio of the longest to shortest R-R interval is called the E:I ratio. Normal Values are > 1.21.

ECG to standing (30:15 Ratio): The shortest R-R interval is measured after standing, which is around the 15th beat. This is followed by bradycardia, which is indicated by the longest R-R interval around the 30th beat. The ratio of the longest to shortest R-R interval is calculated, which is called 30:15 ratio. Normal Values are > 1.03.

Valsalva Maneuver and ratio: When a person forcefully expires against a closed glottis, changes occur in intrathoracic pressure that dramatically affect venous return, cardiac output, arterial pressure and heart rate. The ratio between longest to shortest R-R intervals during and after the maneuver is called as Valsalva ratio.

Cardiac Parameters :

Central Blood Pressure : Central Aortic Systolic Pressure or CASP has been shown to be an important factor in the relation to strokes and cardiovascular events, more so than the brachial pressure, or the pressure at the arm commonly. Central Diastolic pressure is a major factor in perfusion of the myocardium.
Aortic Augmentation Pressure predicts adverse outcomes in patients with CAD independently of PP and other risk markers. Augmentation Index is a very important marker to describe the arterial function.It is mainly reflected to the arterial resistance of the upper body thus it can carry information about the ongoing arterial function and dysfunction.

Carotid Femoral Pulse Wave Velocity (cfPWV) : Stiffening of the aorta and large elastic arteries is a biophysical manifestation of vascular aging with important prognostic implications. It is elevated in conditions such as renal failure, diabetes, and hypertension, and in each of these conditions, it is predictive of subsequent cardiovascular events. cfPWV is the GOLD STANDARD measurement of stiffness of the Aorta.

Endothelial function and large artery stiffness are independent determinants of all-cause and cardiovascular mortality.

Following are the Interpretive and Therapeutic print reports of two Hypertensive patients :

The cardiovascular parameters in both the reports are almost similar, both are uncontrolled hypertensive patients. Both of them have low HRV. Reduced vagal tone is associated with risk of myocardial infarction. Appropriate medications to improve the vagal tone can be more useful in the management of hypertension compared to the patients whose ANS is not studied. This can prevent risk of MI as well as correction of arrhythmias.

Hospitals

Cardiac Risk Profiler

PATIENT DETAILS

Name : Mr. A
Sex : M
Age : 67 Yrs
Wt(kg) : 52
ID : 0001
Ht(cm) : 152
Heart-Ankle : 104.54 cm
Heart-Brachial : 31.25 cm
BMI : 22.51kg/m^2

TEST DETAILS

Date : 30 / 08 / 2016
Time : 14 : 36 : 35
Report Date :01 / 09 / 2016
Report Time : 15:26:20

CLINICAL INTERPRETATION & THERAPEUTIC SUGGESTIONS*

INTERPRETATION:

Total CardioVascular risk grade :Severe with Severe Arterial Stiffness.
Autonomic Nervous System : Abnormal ANS Function
Pulmonary System : Mild Res ESA Obs Low VC

CLINICAL RECOMMENDATIONS:

Consultation for PAD may be advisable.Homocysteine test recommended.Check for ST segment morphology in ECG.Serum Creatinine and Blood Urea test may be advisable.

THERAPEUTIC SUGGESTIONS:

Arterial System : Systemic vascular therapy required. : Strong Consider High dose combo:ß-Blockers+ACEI/ARB/CCB .
Autonomic Nervous System : Lifestyle Modification Required. ARB, ACEI,CCB may be considered.
Pulmonary System: None

*All the Interpretations, Recommendations and Suggestions are subject to clinical evaluation by a qualified Physician.

Hospitals

Cardiac Risk Profiler

PATIENT DETAILS

Name : Mr. B
Sex : M
Age : 44 Yrs
Wt(kg) : 55
ID : 999
Ht(cm) : 166
Heart-Ankle : 112.86 cm
Heart-Brachial : 34.36 cm
BMI : 19.96kg/m^2

TEST DETAILS

Date : 31 / 12 / 2016
Time : 10 : 44 : 26
Report Date :02 / 01 / 2017
Report Time : 15:33:19

CLINICAL INTERPRETATION & THERAPEUTIC SUGGESTIONS*

INTERPRETATION:

Total CardioVascular risk grade considering Age :Severe with Severe Arterial Stiffness.
Autonomic Nervous System : Mild ANS Dysfunction.Sympathovagal imbalance.
Pulmonary System : Moderate Res Severe Obs ESA Obs Low VC

CLINICAL RECOMMENDATIONS:

Homocysteine test recommended.LV function Check is strongly recommended.Lipid profiling may be advisable.
Take precaution while stressful work/exercise.

THERAPEUTIC SUGGESTIONS:

Arterial System : Systemic vascular therapy required. : Strong Consider High dose combo:ß-Blockers+Diuretic+Other .
Autonomic Nervous System : Lifestyle Modification Required. Combo therapy with ARB, ACEI,CCB, Beta-Blockers may be considered. Thiazide/Amlodopine may be considered. Fluids with Sodium and Potassium recommended. May consider SSRI/SNRI/Tricyclics. Cautious titration of OHA/insulin may be considered.
Pulmonary System: Further Pulmonary Investigation is recommended.

*All the Interpretations, Recommendations and Suggestions are subject to clinical evaluation by a qualified Physician.

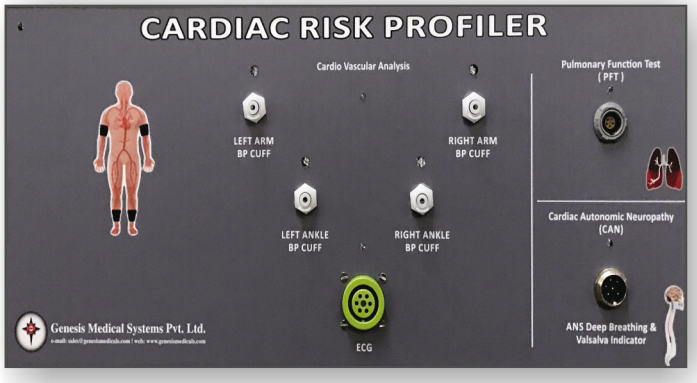
When we analyze the reports, It is observed that both have decreased ANS activity but one presents (Mr.B) abnormal response to postural change. From the HRV parameters and ANS stimulation response we can understand that the line of therapy for both patients will be different. While Mr.A will require reduction in anticholinergic and adding adrenergic agonist to bring his parasympathetic and sympathetic responses to normal, Mr. B would require weaning off from beta blockers and shifting to a combination of ace inhibitor with diuretic or adding calcium channel blocker.

CARDIAC RISK Profiler test details:

1. Cardiac autonomic neuropathy tests include :
   a. Resting Heart Rate
   b. Supine to standing
   c. Valsalva Maneuver
   d. Deep breathing
   e. Complete Time and Frequency domain analysis of HRV as per AHA/ESC guidelines
2. Arterial health analysis test:
   a. ABI for PAD detection by fully automated simultaneous BP readings on all 4 limbs.
   b. Central arterial (Aortic) Systolic , Diastolic and Pulse pressures
   c. Endothelial function
   d. Pulse Wave velocities
   e. Aortic Pressure Augmentation Index
3. Lung function tests
   a. FVC
   b. FEV1

The patient is connected with 4 ECG electrodes (2 lead) and four BP cuffs, other accessories are external viz. lung function The whole test takes about 15 mins, which includes 5 mins of patient conditioning in supine position.

FRONT PANEL:



ACCESSORIES:

Minimum PC Requirements

OS : Windows* 7 / 8/ 10
CPU : Celeron* 1.8 GHZ / i3 / i5 or better processor
HDD : 500GB
RAM : 2GB
Printer : Any Windows* Compatible Inkjet / Laser Jet Printer

Power Requirement and other details

Voltage 230 VAC ± 10%,
Frequency 50 Hz, Power consumption 20VA max

ENVIRONMENT REQUIREMENTS

Operating and storage Temp. 15°C to 45°C
Ambient Relative Humidity 15% to 90%, non- condensing
Operating and storage Pressure/Altitude 523 mm Hg to 760 mm Hg

$ Specifications are subject to change without prior notice

*All regd. Trademarks are acknowledged to their respective owners.

#CARDIAC RISK Profiler uses technology patented by Genesis Medical Systems Pvt. Ltd. as "APPARATUS AND METHODS FOR THE NON-INVASIVE MEASUREMENT OF AORTIC PRESSURE PARAMETERS AND CARDIOVASCULAR SYSTEM PARAMETERS" under Patent No.: 341138

Since R&D is a continuous process, features & specifications are subject to change without notice.

Certifications | CE | EN ISO 13485:2016

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