“The Future of Perfusion”
Presented by Steve Turner CEO

Pending FDA Clearance
What is Quantum®?

1. Its an Extracorporeal Patient Safety System
2. Its a Unique Integration of Hardware & Software Technologies
3. It’s a Solution that Truly Recognizes Perfusion is about LIFE SUPPORT
The Quantum Work Station
The Quantum Workstation

Your window into a new world of Perfusion Management
Extra - Corporeal Patient Monitoring

Integrated Medical Device Connectivity Using:

RS 232 / 485, Wi-Fi and LAN (Cabled Ethernet)
The Quantum App Store
Working With Quanterra Perfusion

Spectrum Medical
The Measurement of $\text{SaO}_2$, $\text{SvO}_2$ and Hct / Hb
The Quantum “0 to 10 lpm” Ventilation System

3 Gas & 2 Vac. / 2 Gas & 3 Vac. / 3 Gas Only
The continuous monitoring of incoming of Gas Concentrations and System Supply Pressures.

- $\text{O}_2$, $\text{CO}_2$ - Concentration and Supply Pressures
- Air - Supply Pressure
- Standby System – Supply Pressure
- Vacuum – Supply Pressure
The continuous monitoring of external pressures applied to the CBP circuit.

- Vacuum Assisted Venous Drainage Pressure (VAVD)
- Waste Anesthesia Gas Extraction (Automated)
- Mixed Gas Delivery to the Oxygenator “gas in” connection
The continuous monitoring of gas flow concentrations and Gas Flow Rates.

- $O_2$ and $CO_2$ Gas Concentrations to the Oxygenator
- Overall Gas Flow to the Oxygenator (Sweep)
- $O_2$ and $CO_2$ Concentrations measured at the Primary Exit Port
- Anesthesia Gas Concentrations to the Oxygenator
Ventilation Diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{PO}_2$</td>
<td>mm Hg / kPa</td>
<td>The partial pressure of $\text{O}_2$ within the Arterial blood</td>
</tr>
<tr>
<td>$\text{PCO}_2$</td>
<td>Hg / KPa</td>
<td>The partial pressure of $\text{CO}_2$ within the Arterial blood</td>
</tr>
<tr>
<td>$\text{FiO}_2$</td>
<td>%</td>
<td>The fraction of inlet $\text{O}_2$ to the oxygenator</td>
</tr>
<tr>
<td>$\text{FiCO}_2$</td>
<td>%</td>
<td>The fraction of inlet $\text{CO}_2$ to the oxygenator</td>
</tr>
<tr>
<td>Sweep</td>
<td>L / min</td>
<td>Total gas flow to the oxygenator</td>
</tr>
<tr>
<td>$\text{FeCO}_2$</td>
<td>%</td>
<td>The fraction of exit $\text{CO}_2$ from the oxygenator</td>
</tr>
<tr>
<td>$\text{FeO}_2$</td>
<td>%</td>
<td>The fraction of exit $\text{O}_2$ from the oxygenator</td>
</tr>
</tbody>
</table>

Plus: 2 x Flow, 2 x Emboli and 2 x Temperature Channels
## Calculated Physiologic Parameters

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<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecDO₂</td>
<td>mL/min</td>
<td>Adequacy of tissue oxygenation. The amount of O₂ bound to hemoglobin in arterial blood.</td>
</tr>
<tr>
<td>ecVO₂</td>
<td>mL/min</td>
<td>Oxygen consumption: systemic oxygen uptake</td>
</tr>
<tr>
<td>ecO₂ER</td>
<td>%</td>
<td>O₂ Extraction Ratio: the ratio of Oxygen consumption to Oxygen delivery.</td>
</tr>
<tr>
<td>ecDO₂i</td>
<td>mL/min/m²</td>
<td>The amount of O₂ bound to Hemoglobin in Arterial blood divided by BSA</td>
</tr>
<tr>
<td>ecVO₂i</td>
<td>L/min/m²</td>
<td>The consumption of Oxygen divided by BSA</td>
</tr>
<tr>
<td>ecVCO₂i</td>
<td>mL/min/m²</td>
<td>CO₂ production divided by BSA</td>
</tr>
<tr>
<td>ecVCO₂</td>
<td>mL/min</td>
<td>CO₂ production</td>
</tr>
</tbody>
</table>
This is Blending
This is Ventilation
This is “cool” Ventilation
This is Vacuum Management
The Spectrum Network
The Spectrum Network

Hospital HIS

VISION Server

QUANTUM Workstations via wi-fi/LAN
The Spectrum Network

VISION Server

Hospital HIS

LIVE VUE Command Center

QUANTUM Workstations via wi-fi/LAN

VISION Server

Integrated Device Connectivity

Device #1  Device #2  Device #3  Device #4
The Spectrum Network

- **Hospital HIS**
- **LIVE VUE Command Center**
- **VISION Server**
- **QUANTUM Workstations** via wi-fi/LAN
- **VIPER Tablets** via wi-fi/LAN
- **Integrated Device Connectivity**
  - Device #1
  - Device #2
  - Device #3
  - Device #4

Spectrum Medical
LIVE VUE

• Central and Remote Visibility of Real Time Clinical Information

• Viewing Modes:  
  Big Board = All Patients  
  Team Track = View Patients by Clinician

• Integrated with Best Practice and Alert Systems

• Real-Time display of Vital Signs, Medication Activity, Events, Waveforms etc.

• Case Playback for M & M Review and Training
Thank You