Forward Looking Statement

This corporate presentation contains forward-looking statements, which reflect the Company’s current expectations regarding future events. The forward-looking statements involve risks and uncertainties. Actual events could differ materially from those projected herein and depend on a number of factors, including the successful and timely completion and the commercialization of the products herein. The reader of this document is forewarned concerning the inherent variability and risk associated in terms of strategies or deliverables stated herein by the Company and is cautioned prior to considering these forward-looking statements. The Company disclaims any obligation to update these forward-looking statements.
Opsens Overview

- Key player in cardiovascular medical devices
- Innovative fiber optic pressure guidewire

**Measurement of Fractional Flow Reserve (FFR) to assess coronary blockages**
- Assessment helps in selecting an appropriate treatment
- The OptoWire can also be used to deliver stents in the treatment of blockages.
Opsens at a Glance

$1B
Future market opportunity

40,000
Patients treated in 30 + countries

OptoWire Performance recognized in medical publications

85%
Yearly Revenue Growth

Strong IP
Potential for partnerships in cardiology

Technology may be used in other applications e.g. Abiomed
What is Fractional Flow Reserve (FFR)

- FFR is used for diagnosis of patients
  Evaluation of the severity of a coronary artery blockage.
  Cardiologists measure blood pressure before / after a blockage and obtain a ratio. This ratio helps in selecting treatment (angioplasty, stenting, bypass, etc.).

- FFR may be used for treatment of patients
  Once the cardiologist has selected the treatment, he can treat the blockage immediately by stenting the lesion.

[Opsens Video]
Fractional Flow Reserve (FFR)

Max achievable blood flow in stenotic coronary artery divided by Max blood flow in the same artery without stenosis

FFR = \frac{P_d}{P_a}

At maximum hyperemia

>0.8 may be treated without angioplasty

0.80

<0.80 inducible ischemia – interventional treatment needed i.e. stent

FAME Study – FFR-guided therapy improves clinical outcomes of patient resulting in significant decrease of major adverse cardiac events
FFR Market Overview

As FFR becomes more mainstream, the pressure guidewire market is poised for disruption

Backdrop

- Studies prove FFR superior to angiography to guide Percutaneous Coronary Interventions (PCI)
- 2017 - New Appropriate Use Criteria (AUC) shows patients with acute myocardial infarction (STEMI) benefit from FFR-guided treatment as it lowers incidence of Major Adverse Cardiovascular and Cerebrovascular Event (MACCE)
- FFR used to assess increasingly complex lesions
- Hospitals now acutely sensitive to costs and appropriate PCI
- FFR guidewire market - large growing market in cath lab as it improves patient outcomes and can lower costs

Penetration

- Despite strong outcome data, FFR guidewires are underutilized
- Performance of conventional pressure guidewires is an obstacle to market penetration

<table>
<thead>
<tr>
<th>Year</th>
<th>Milestones</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>FAME I Study</td>
<td>Angiography + FFR + Stent superior to Angiography + Stent</td>
</tr>
<tr>
<td>2010</td>
<td>EU: ESC Class I Level of Evidence A</td>
<td>Highest class &amp; level: Procedure beneficial, useful &amp; effective</td>
</tr>
<tr>
<td>2011</td>
<td>US: ACC/AHA Class IIA Level of Evidence A</td>
<td>Benefits of FFR outweigh risks &amp; can be useful as a tool</td>
</tr>
<tr>
<td>2012</td>
<td>FAME II Study</td>
<td>Angiography + FFR + Stent + OMT superior to Angiography + OMT</td>
</tr>
<tr>
<td>2012 cont’d</td>
<td>Reimbursement Code for FFR</td>
<td>Several countries have codes Japan, France, UK, Germany, etc.</td>
</tr>
<tr>
<td>2017</td>
<td>AUC Revision Compare-Acute Study</td>
<td>FFR growing use and importance (STEMI)</td>
</tr>
<tr>
<td>2018</td>
<td>AUC Revision</td>
<td>Inclusion of other physiological measurements without hyperemia</td>
</tr>
<tr>
<td>2018</td>
<td>Change in Regulation Japan</td>
<td>New: Evaluation of all coronary stenosis Mention: FFR a preferred method</td>
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FFR: Growing Market with Upside
Potential for significant market share capture through product innovation and differentiation

Key Market Drivers

**2014 FFR market: >US$300 M**
- Current FFR procedure penetration: ~15%\(^1\)
- Industry players estimate potential procedure penetration closer to 45%\(^2\)

Drivers
- FFR-guided PCI improves patient outcomes
- Better FFR devices, easier to use
- Increased confidence in procedure – AUC
- Increasing need to control costs
- FFR could facilitate reimbursement by hospitals and third-party payers
- Increased indications of use
  - Left-main, Bifurcation, Non-Stemi

<table>
<thead>
<tr>
<th>Year</th>
<th>FFR Market (US$ M)*</th>
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<tbody>
<tr>
<td>2009</td>
<td>75</td>
</tr>
<tr>
<td>2010</td>
<td>124</td>
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<tr>
<td>2011</td>
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<td>2014</td>
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<td>2015</td>
<td>350</td>
</tr>
<tr>
<td>2016</td>
<td>400</td>
</tr>
<tr>
<td>2017</td>
<td>456</td>
</tr>
</tbody>
</table>

Beyond

- 1 billion

\(^1\) S. Huennekens, “Volcano NASDAQ Analyst Day” PowerPoint p.44 (2013-03-07) [Huennekens PowerPoint]
\(^2\) D. Stark, “St Jude Medical 2013 Investor Conference” p.105 (2013-02-01) [D. STARKS]

* St-Jude Medical 2015 – Investor Conference, (2015-02-06)
Based on growth projected in Global FFR Market 2016-2020
OptoWire Advantage – One Wire from Start to Finish
Best-in-class technology overcomes limitations of conventional pressure guidewires

Current FFR Products Limitations
- Limitations of current guidewires prevent them from being used from start to end of procedure for diagnostic and treatment (steerability, support, drift, and connectivity)
- Reliability of measurement is affected by length of procedure (incidence on drift)
- Unreliable connectivity - highly sensitive electrical contact results in uncertainty to reconnect and loss of signal which affects workflow and ability to perform post-PCI FFR

OptoWire Solution
- Nitinol-based pressure guidewire design delivers workhorse equivalent performance
- Opsens’ patented optical sensor eliminates drift and thermal shift
- Worry-free reconnect

OptoWire Impact
- OptoWire’s workhorse performance allows easier reach of all lesions of interest – One-wire PCI
- Sensor stability and connection reliability for a more accurate diagnostic - Operator confidence

"The arrival of an optical FFR guidewire such as the OptoWire on the market is positive for interventional cardiologists and will be helpful to promote the use of FFR."
—Dr. Nico Pijls, Catharina Hospital, Netherlands
Opsens’ Products

OptoWire
- Exceptional handling
- Reliable strength and support
- Revolutionary consistency and accuracy
- Worry-free reconnect

OptoMonitor
- Seamless and simple integration
- Intuitive workflow
- Small footprint
- FFR data output options

Sold in +30 countries including USA, Japan, Canada and European countries
OptoWire
Nitinol core significantly improves torqueability and kink resistance of the guidewire

Traditional FFR wire

- Older piezoelectric technology requires three electrical wires that offset the core wire from the center, resulting in whipping and limited torqueability

  3 electrical cables
  
  Core wire
  Core member
  OD = 0.0035” to 0.0055”

- Electrical pressure sensors are sensitive to their environment
- Due to limited space inside the guidewire, the piezo-resistive pressure sensor must use a half bridge design to minimize the number of electrical wires that run the length of the wire

OptoWire

- Central fiber-optic eliminates electrical wires and associated whipping, yielding space for larger and stronger nitinol core

  Outer SS spiral cut tube 0.014”
  Optical fiber 0.004”
  Nitinol tube
  ID=0.0045”
  OD= 0.009”

- Large nitinol core provides strength, flexibility and rotates independently of the exterior, allowing 1:1 transmission of torque, even when the exterior is engaged
### OptoWire - Reliable Fiber Optic Sensing Technology

**OptoWire - Reliable Measurement Throughout Procedure**

#### Most common “technical” pitfalls:
- drift of the signal
- introducer
- pitfalls associated with guiding catheter
- knowledge of adequate hyperemic stimuli

<table>
<thead>
<tr>
<th></th>
<th>Next-Gen FFR</th>
<th>Traditional FFR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>opSens</strong></td>
<td><strong>Boston Scientific COMET</strong>²</td>
</tr>
<tr>
<td>Drift from zero (mmHg/h)</td>
<td>&lt;1</td>
<td>&lt;3</td>
</tr>
</tbody>
</table>

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1) Opsens Medical. Data on File
2) Chambers, Jeff. Electric or Optical Fibers Based Pressure Measurements. Presentation sponsored by Boston Scientific, 19th Tremblant Interventional Cardiology Meeting. 2016
3) St. Jude. PressureWire Aeris, Instructions for Use, 20828 Rev 0F
Medical publications

Opportunities to Create Value with Additional Clinical Work

Opsens’ Clinical Strategy

- Improve OptoWire’s positioning
  - One-wire PCI
  - Accuracy
- Contribute to physiology
  - Post-PCI FFR
  - Resting measurement methods
OptoWire Performance – Worry-Free Reconnect

Strong Distinction Between Optical and Electrical Technology

Optical contact not affected by procedural contact contaminant

- Competitor’s electrical technology sensitive to contact resistance

Workflow freedom with FFR reliability

- Disconnect, handle FFR wire like standard PCI wire
- Reconnect and perform post-PCI FFR
- May save time and money with improved effectiveness

"It was a pleasure to use the OptoWire in several patients, some of them with complex disease. It allowed me to appreciate its impressive zero drift performance during all cases performed while also acknowledging the constant connection reliability as well as its support during percutaneous coronary intervention."

— Dr. Bernard de Bruyne, Cardiovascular Center Aalst, Belgium
Functional Optimization of Coronary Intervention Using Post-PCI Fractional Flow Reserve: A Prospective Registry

BF Uretsky MD, Shiv Agarwal MD, Kristin Miller RN, Malek Al-Hawwas MD, Abdul Hakeem MD
Central Arkansas VA Hospital and UAMS, Little Rock, AR

BACKGROUND

Physiological lesion assessment by FFR after successful PCI (post-PCI FFR) has been related to long-term outcomes with the highest values showing the lowest MACE rate. Recently, it has been shown in a retrospective study that post-PCI FFR may be ischemic in as high as 20% of cases after angiographically optimized PCI and that FFR can be improved by further intervention in a majority of cases.

These findings suggest modifying the current PCI paradigm to use FFR routinely for all lesions with measurement of FFR post-PCI to determine “functional optimization”. This approach requires a pressure wire with characteristics simulating a “work horse” wire.

We used a new generation pressure wire (OptoWire, Opsens, Quebec, CA) with excellent handling characteristics to measure pre- and post-PCI FFR for all routine non-CTO interventions. We developed a prospective registry to study this clinical approach. This presentation describes the results of first group of patients enrolled from Mar 1, 2017 – Oct 1, 2017.

STUDY PURPOSE

To determine:
1) the frequency of ischemic FFR post-PCI after angiographic optimization
2) to determine the ability to increase low FFR by further intervention after angiographic optimization
3) to determine the performance of the OptoWire wire for severe as well as intermediate lesions.

METHODS

-Prospective registry of FFR-guided PCI as routine clinical approach using the OptoWire as a “work horse” guide wire with FFR measured pre- and post-PCI - Exclusion criteria:
  ST elevation myocardial infarction
  Hemodynamic instability
  Chronic total occlusion
  Saphenous vein PCI
  Operator preference

RESULTS

86 patients (87 lesions): SIHD 60, ACS 26
Success rate 98.9% (86/87); stenosis pre- 81±12%, post- 2±7%, p<0.0001

FFR Pre- and Post-PCI

After angiographic optimization, FFR showed an ischemic value (<0.80) in 18% (16/87) of stented vessels. Of these lesions, 8 underwent further intervention with significant improvement in FFR. The other 8 vessels were considered to have diffuse disease and not amenable to further intervention.

Pressure wire performance:
1) Ability to cross lesion with OptoWire 87%
   Crossing with other wires 12%
   Pilot 200 1
   Fielder XT 1
   Runthrough 8
   Not able to cross lesion with any wire 1%

2) Characteristics of lesions not crossed with Optiwire (n=11)
   Moderate/heavy calcification 100%
   Stenosis severity 93±8%

3) Extent of drift 0.01±0.02

Further intervention improved FFR by 0.08 on average.

CONCLUSIONS

1. This study confirms the frequency of ischemic FFR in angiographically optimized stented lesions in approximately 20% of lesions and the ability to improve low FFR with further intervention.
2. This study demonstrates the feasibility of a pressure wire with good handling characteristics to perform routine intervention in severe lesions and efficiently determine presence or absence of ischemia after angiographic optimization.
Demonstrate benefits of performing post-PCI FFR

- ↓ rate of major cardiac events with post-PCI FFR
- FFR can guide optimization
- Results suggest using post-PCI FFR for functional optimization (all lesions). Need for a pressure guidewire with Workhorse features.

OptoWire (OW) to measure pre and post-PCI FFR

- Excellent handling characteristics
- Precision of measure
- Capacity to disconnect and to reconnect.

Goal

1. Frequency of <0.8 FFR after stent
2. Ability to ↑ FFR by additional intervention
3. Performance of OW for severe, intermediate lesions.

Performance, Results and Conclusions

1. Frequency <0.8 after stent: ≈ 20%
2. Possible to ↑ FFR by 0.08 with additional intervention
3. Perform intervention with OW only: 87% of cases
   Extent of drift OW: 0.01± 0.025

A pressure guide wire with good mechanical characteristics makes it possible to perform a routine intervention in severe lesions and to determine the presence or absence of ischemia after angiographic optimization.
Strong IP (10 patents) – Strategic in Creation of Partnerships

- Freedom to operate is challenging to obtain in FFR and significantly limits potential for newcomers
  - **Electrical pressure sensing**: Extensive IP owned by Phillips / Volcano and Abbott / St. Jude
  - **Optical pressure sensing**: Opsens is the first-comer and IP leader
- Opsens’ IP may prohibit FTO and any other companies using optical pressure sensing

Guidewire - 1 patent
- Guidewire with internal pressure sensor

Optical Sensor - 3 patents
- Optical sensor using low-coherence interferometry
- Fiber-optic pressure sensor for catheter use
- Miniature high sensitivity pressure sensor

Optical Connector - 4 patents
- Method for disposable guidewire optical connection

Microcatheter / Equalization - 2 patents
- Eccentric pressure catheter with guidewire compatibility
- Method for pressure guidewire equalization
- Pressure based blood vessel assessment systems and methods

Protected by 10 Patents
Opsens is focusing on the medical device industry.

Opsens Solutions’ applications include: semiconductors, aerospace and other industries.
Unique and differentiated product capabilities

• Positive buzz around our technology

Full range of sensing solutions

• Pressure
• Temperature
• Displacement
• Strain

Lead markets

• Laboratories, aerospace, semiconductors

Strategy

• Capitalize on technologies and on product range
• Develop marketing network.
Creating Value for Shareholders

**Key Considerations**

- Product performance recognized by key opinion leaders
- Growing markets: US, EU, JPN, CAN
- Building clinical data
- 40,000 cases performed*
- Improvement of production processes
- Sales channels in >30 countries

**Value Drivers**

- Market share gain – Revenue growth
- Clinical data
- Innovation – OWIII, OMIII and dPR
- Technology allows for applications to be used in various exciting markets.

* Based on internal records
Opsens Operations (TSX:OPS – OTCQX:OPSSF)

Operations & finance

- 130 employees
- Lean manufacturing approach - increasing gross margin
- 85% Revenue growth
- Shares Outstanding (diluted) - 90 M (95 M)
- 52-week High / Low - $1.50 / $0.83
Opsens Operations (TSX:OPS – OTCQX:OPSSF)

Sales & Marketing

• Sales channels around the world
• US market penetration to increase as adoption rates grow
• Opsens’ technology may be used in other exciting applications
e.g. licensing agreement with Abiomed (NASDAQ:ABMD).

Opsens headquarters, QC Canada

Opsens - Clean room
## Conclusion

|                 | • Increased confidence in FFR (new AUC) |
| Product         | • Advanced technology in pressure guidewire  
|                 | • Workhorse-type guidewire, no drift |
| Sales           | • Significant product adoption - limited sales channels |
| R&D             | • Superior platform - Technology with strong future pipeline |
| IP              | • Patented technologies – strong IP portfolio |
| Installation    | • Ready for substantial growth |
| Team            | • Experts in fiber optic technologies |

**Vision: to become a leader within a few years**