

CytoSorbents™



HELPING REDUCE DEADLY UNCONTROLLED INFLAMMATION IN HOSPITALIZED PATIENTS WORLDWIDE

NASDAQ: CTSO

Oppenheimer 31st Annual Healthcare Conference

March 16, 2021

Safe Harbor Statement

This presentation contains “forward-looking statements” pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include, without limitation, any statement that may predict, forecast, indicate, or imply future results, performance or achievements, and may contain the words “estimate,” “intend,” “target,” “will,” “is likely,” “would,” “may,” or, in each case, their negative, or words or expressions of similar meaning. These forward-looking statements are found at various places throughout this presentation and include information concerning possible or assumed future results of our operations; business strategies; future cash flows; financing plans; plans and objectives of management; any other statements regarding future operations, future cash needs, business plans and future financial results, and any other statements that are not historical facts. Unless otherwise indicated, the terms “CytoSorbents,” “Company,” “we,” “us” and “our” refer to CytoSorbents Corporation. Any or all of the forward-looking statements included in this presentation are not guarantees of future performance and may turn out to be inaccurate. These forward-looking statements represent our intentions, plans, expectations, assumptions and beliefs about future events and are subject to risks, uncertainties and other factors. Many of those factors are outside of our control and could cause actual results to differ materially from the results expressed or implied by those forward-looking statements. Although these expectations may change, we are under no obligation to inform you if they do. Actual events or results may differ materially from those contained in the forward-looking statements. The following factors, among others, could cause our actual results to differ materially from those described in a forward-looking statement: our history of losses; potential fluctuations in our quarterly and annual results; competition, inability to achieve regulatory approval for our device, technology systems beyond our control and technology-related defects that could affect the companies’ products or reputation; risks related to adverse business conditions; our dependence on key employees; competition for qualified personnel; the possible unavailability of financing as and if needed; and risks related to protecting our intellectual property rights or potential infringement of the intellectual property rights of third parties. This list is intended to identify only certain of the principal factors that could cause actual results to differ from those discussed in the forward-looking statements. In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements might not occur or might occur to a different extent or at a different time than we have described. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of the applicable presentation. You are referred to a discussion of important risk factors detailed in the Company’s Form 10-K filed with the Securities and Exchange Commission on March 9, 2021 and other reports and documents filed from time to time by us, which are available online at www.sec.gov.

CytoSorbents



Leading the Prevention or Treatment of
Life-Threatening Inflammation and Cytokine Storm
in the ICU and Cardiac Surgery using
CytoSorb® Blood Purification

CytoSorbents At a Glance (NASDAQ: CTSO)

- CytoSorbents is a rapidly growing international NASDAQ-traded medical device company with ~200 employees, ~\$40M in 2020 product sales & \$71M in cash (2020)
- CytoSorb® is E.U. approved and commercialized in 67 countries as an extracorporeal cytokine adsorber to help treat deadly inflammation where cytokines are elevated (e.g. “cytokine storm”).
- Overall, we have shipped more than 121,000 devices to date. Also, treated >5,000 COVID-19 patients in 30+ countries, including in the U.S. under FDA Emergency Use Authorization for use in critically-ill, adult COVID-19+ patients with respiratory failure
- CytoSorb is also E.U. approved to remove bilirubin (liver dialysis), myoglobin (trauma), and blood thinners Brilinta® (ticagrelor) and Xarelto® (rivaroxaban) during cardiothoracic surgery
- CytoSorb is on a dual path to potential U.S. FDA approval
 - FDA Breakthrough Designation to remove Brilinta (ticagrelor) during emergent and urgent cardiothoracic surgery – targeting a \$250M total addressable market in the U.S.
 - U.S. REFRESH 2-AKI Trial – 400 patient pivotal study using CytoSorb intraoperatively to reduce post-op AKI
- Partnered with leading companies:



* CytoSorb has been authorized by the FDA under an EUA for use in COVID-19 patients and will remain active until terminated by the Agency. The CytoSorb device has neither been cleared nor approved for the indication to treat patients with COVID-19 infection

CytoSorbents™

Products and Product Pipeline

Internal development supplemented by strong government support with ~\$38M in grants, contracts, other non-dilutive funds awarded to our technology from DARPA, NIH, NHLBI, US Army, US Air Force, HHS, and others, to date



Sepsis,
Critical Care,
High Risk
Surgery
CE

ECOS-300CY[®]

Ex Vivo Organ
Perfusion
For Transplant
CE



Critical
Illnesses in
Animals

Marketed

HemoDefend RBC

Purification of pRBCs

HemoDefend BGA

Universal Plasma



CytoSorb-XL

Successor to CytoSorb



K+ontrol

Severe Hyperkalemia



ContrastSorb

CT Imaging and
Interventional Radiology



DrugSorb

Drug Overdose

Under Development



What does CytoSorb do and How does it work??

Millions Die from Uncontrolled Deadly Inflammation



A Powerful New Approach to Controlling Inflammation

CytoSorb has been used and well-tolerated in more than 121,000 cumulative treatments as a way to treat cytokine storm and reduce the “fuel to the fire” of inflammation

Anti-Inflammatory (too weak)

NSAIDs

Aspirin

Anti-cytokine
antibodies

Anti-integrin
antibodies

Anti-oxidants



Immunosuppressive (too strong)

Corticosteroids

Chemotherapy

Organ transplant
Anti-rejection drugs

Radiation

Immune system
ablation

Anti-leukocyte Abs

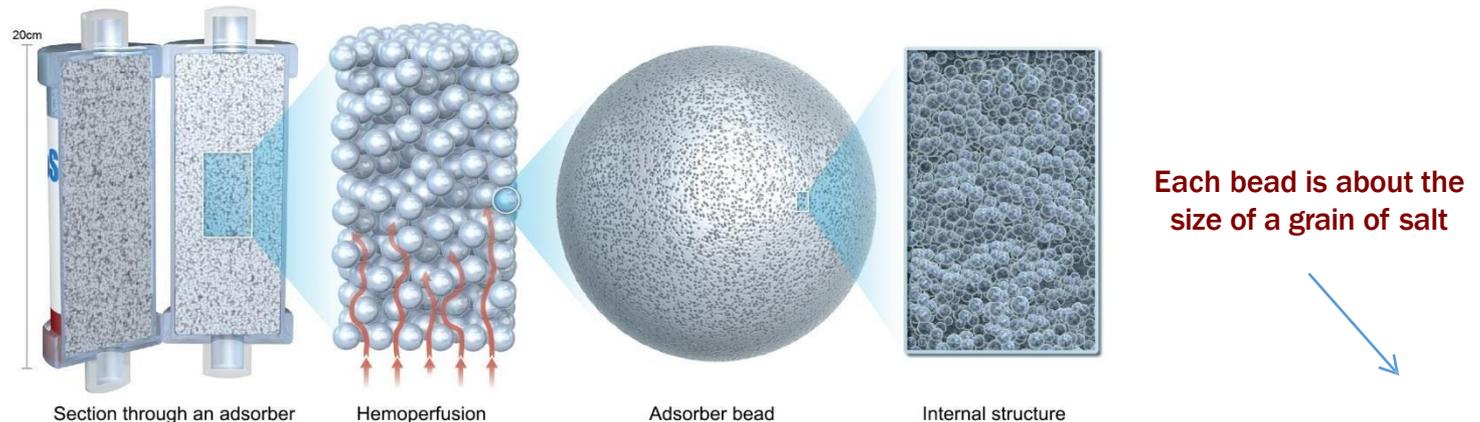
GOALS OF TREATMENT

↑
Improve
Patient
Outcome
& Survival

↓
Decrease
Costs Of ICU
& Patient
Care

Patented Blood Purification Technology

The underlying blood purification technology is based on biocompatible, highly porous polymer beads that act like tiny sponges to remove harmful substances from blood

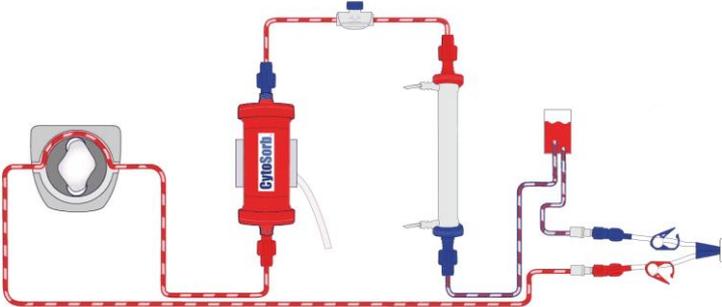


- Proprietary patented technology with 16 issued U.S. patents and multiple patents issued and pending worldwide
- Manufactured at our ISO 13485 certified facility in New Jersey

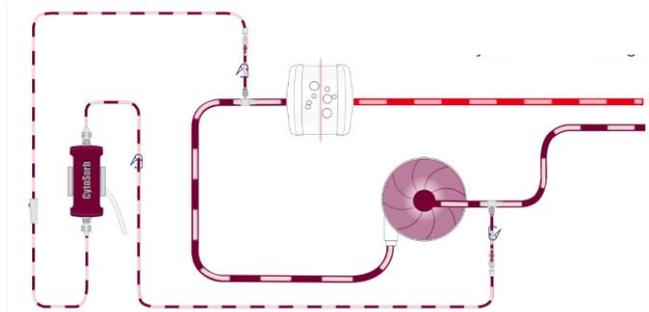
CytoSorb is “Plug and Play” Compatible

Compatible with Existing Blood Pump Infrastructure In Hospitals Today

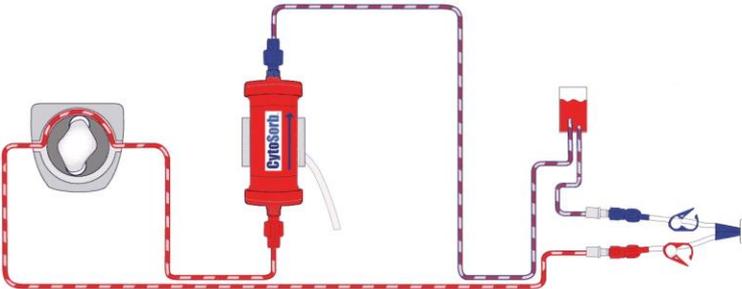
Dialysis or CRRT
(Continuous Renal Replacement Therapy)



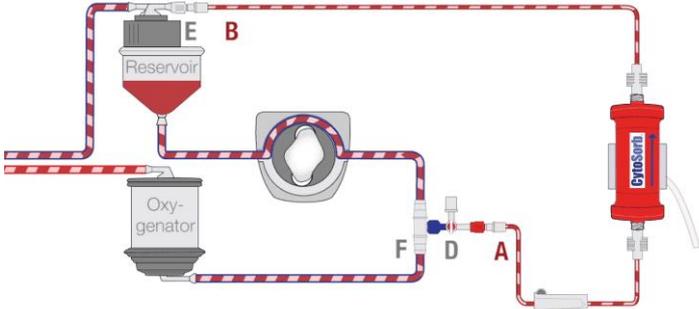
ECMO
(Extracorporeal Membrane Oxygenation)



Hemoperfusion
(Standalone Treatment)



CPB
(Cardiopulmonary Bypass)





What is the Company's Business model and Financial performance?

CytoSorbents Has a Strong Hybrid Sales Model

67 Countries Worldwide and 121,000+ treatments

Critical Care and Cardiac Surgery

Direct Sales

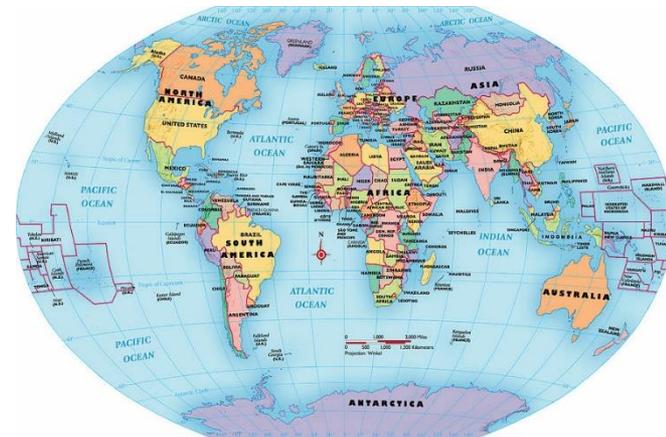


Distributor and Partner Sales



Direct sales in 10 countries:

Germany, Austria, Switzerland, Belgium, Poland, Netherlands, Denmark, Norway, Sweden, Luxembourg

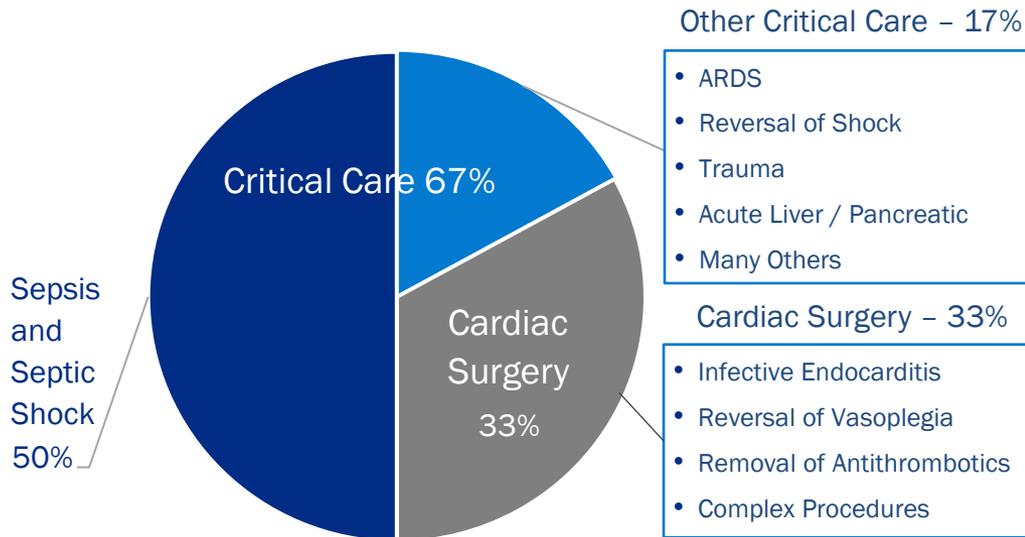


Distributor and Partner sales in 57 other countries

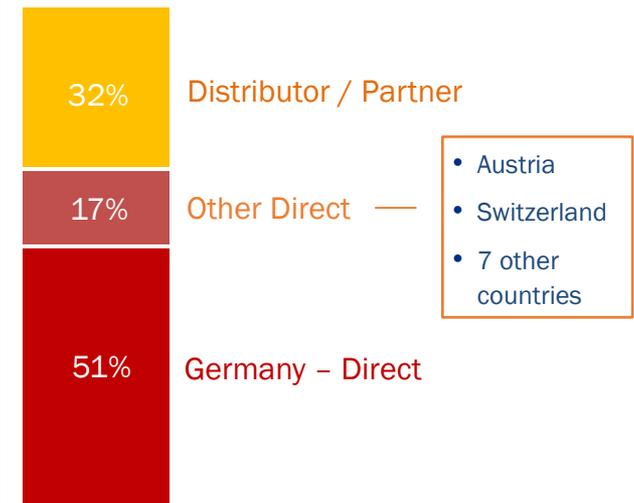
Entered U.S. under FDA EUA, added Mexico and South Korea with partner, Fresenius Medical Care, and expanded extensively in Latin America

CytoSorb Commercialization Focus

By Market



By Geography



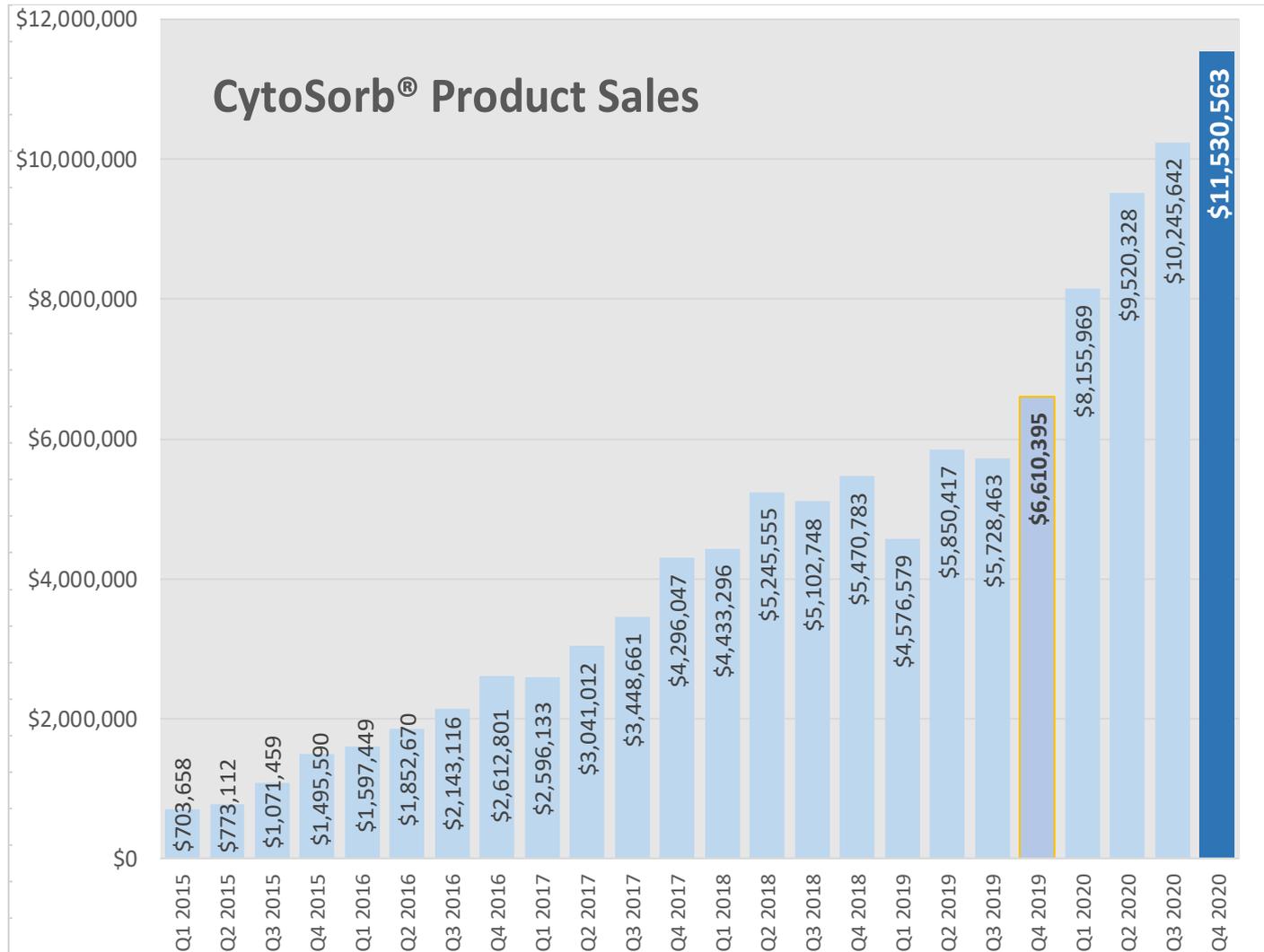
2020

CytoSorb Is a High Margin “Razorblade”

- High margin “razorblade” fully compatible with existing installed base of “razor” blood pumps: Dialysis, CRRT, and ECMO machines (ICU), and heart-lung machines (OR)
- Blended gross margins were ~80% in Q4 2020, driven by volume production from our new manufacturing facility and manufacturing efficiencies.
- Average Direct Selling Price is approximately \$1,000 per cartridge
- ~1 - 5 cartridges are typically used per patient depending on the course of treatment
 - Open heart surgery: 1-2 cartridges
 - Sepsis: 3-5 cartridges (or the cost of roughly 1 day in the ICU)
 - ARDS and ECMO: 5+ cartridges
- In Germany, 400 hospitals have >400 beds. Each hospital typically sees 300-600 sepsis patients per year. At 3-5 cartridges per patient:
 - Revenue per patient = ~\$3,000-5,000
 - Potential revenue per hospital = \$1-3M for sepsis alone
- Previously disclosed one German hospital with sales >\$1M, broadly adopting the use of CytoSorb in critical care and cardiac surgery, validating revenue model. Other hospitals are tracking along same path, giving us visibility on future growth

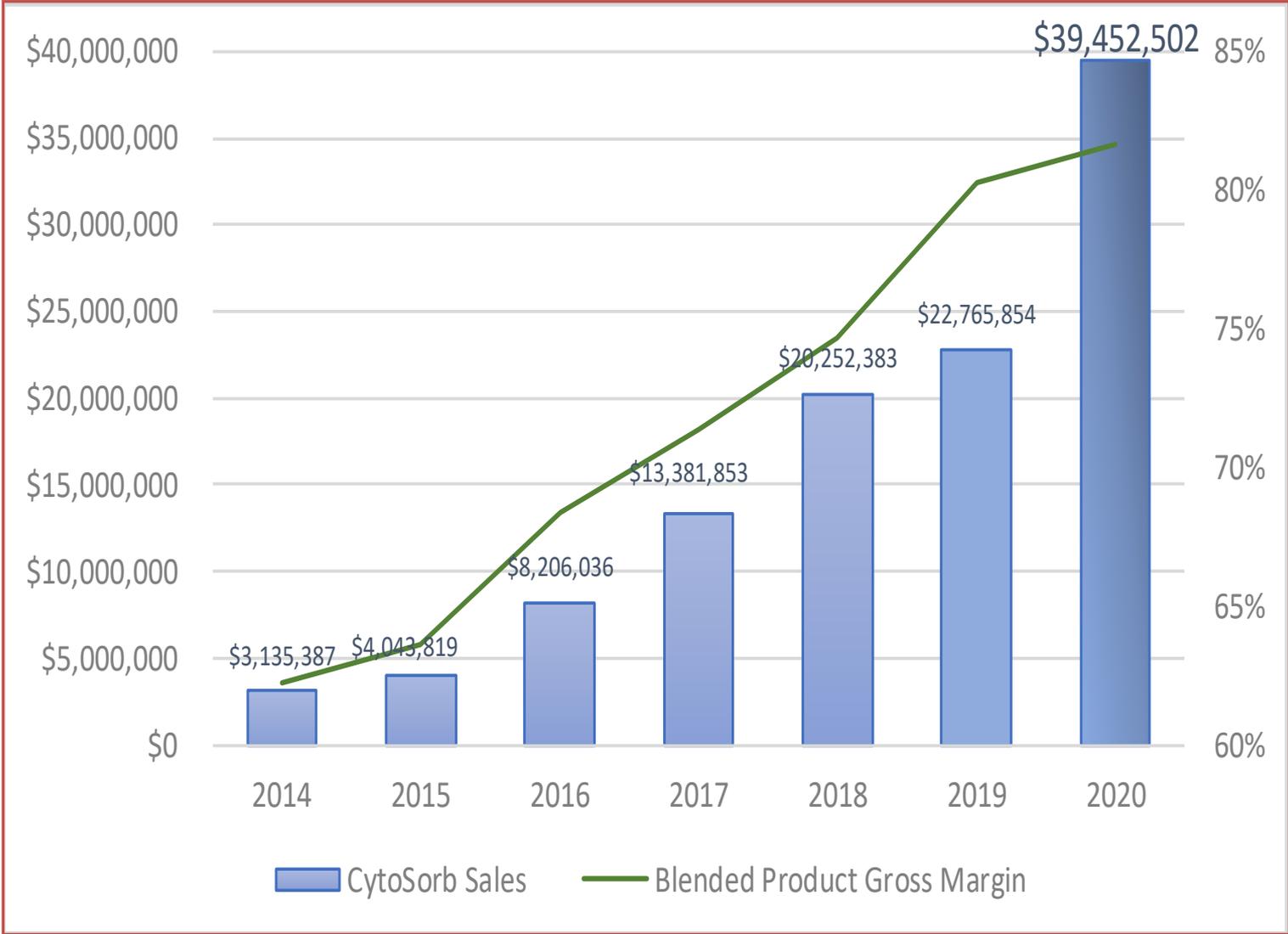
Quarterly Product Sales

Q4 2020 was another record quarter for product sales, up 74% from Q4 2019



Annual Product Sales and Gross Margins

2020 Product Sales grew 73% over 2019, with Q4 2020 Gross Margins of 82%





What are the catalysts for growth?

Strategy For Continued High Margin Growth



Global Expansion

Direct Sales

New Clinical Data

New and Existing Applications

Scaled Manufacturing

INVESTMENT

COVID-19 Accelerates World Adoption



- COVID-19 has put a spotlight on CytoSorb as a broad spectrum treatment of complications of uncontrolled, severe hyperinflammation, such as ARDS, shock, and kidney failure, caused by cytokine storm and other factors

The New York Times

Bloomberg
RADIO

FOX
BUSINESS

TheStreet.

- CytoSorb has been used to treat >5,000 critically-ill COVID-19 patients in 30+ countries
 - Reduction of cytokine storm and inflammatory mediators such as IL-6, ferritin, CRP, and others
 - Improved respiratory function in ARDS and weaning from mechanical ventilation and ECMO
 - Improved hemodynamic stability and reversal of shock
- CytoSorb received U.S. FDA Emergency Use Authorization in April 2020, enabling CytoSorb to be commercially sold to all hospitals in the U.S. for use in adult, critically-ill, COVID-19+ patients with imminent or confirmed respiratory failure.*
- CytoSorb is now distributed in 67 countries worldwide. We believe COVID-19 has accelerated uptake, particularly in the distributor and strategic partner channel, that will fuel continued sales momentum post-COVID-19

* CytoSorb has been authorized by the FDA under an EUA for use in COVID-19 patients and will remain active until terminated by the Agency. The CytoSorb device has neither been cleared nor approved for the indication to treat patients with COVID-19 infection

Expanded Workforce from 105 to 200 in 2+ Years



November 2018



Increased headcount focused heavily on commercialization and manufacturing to drive growth

February 2021



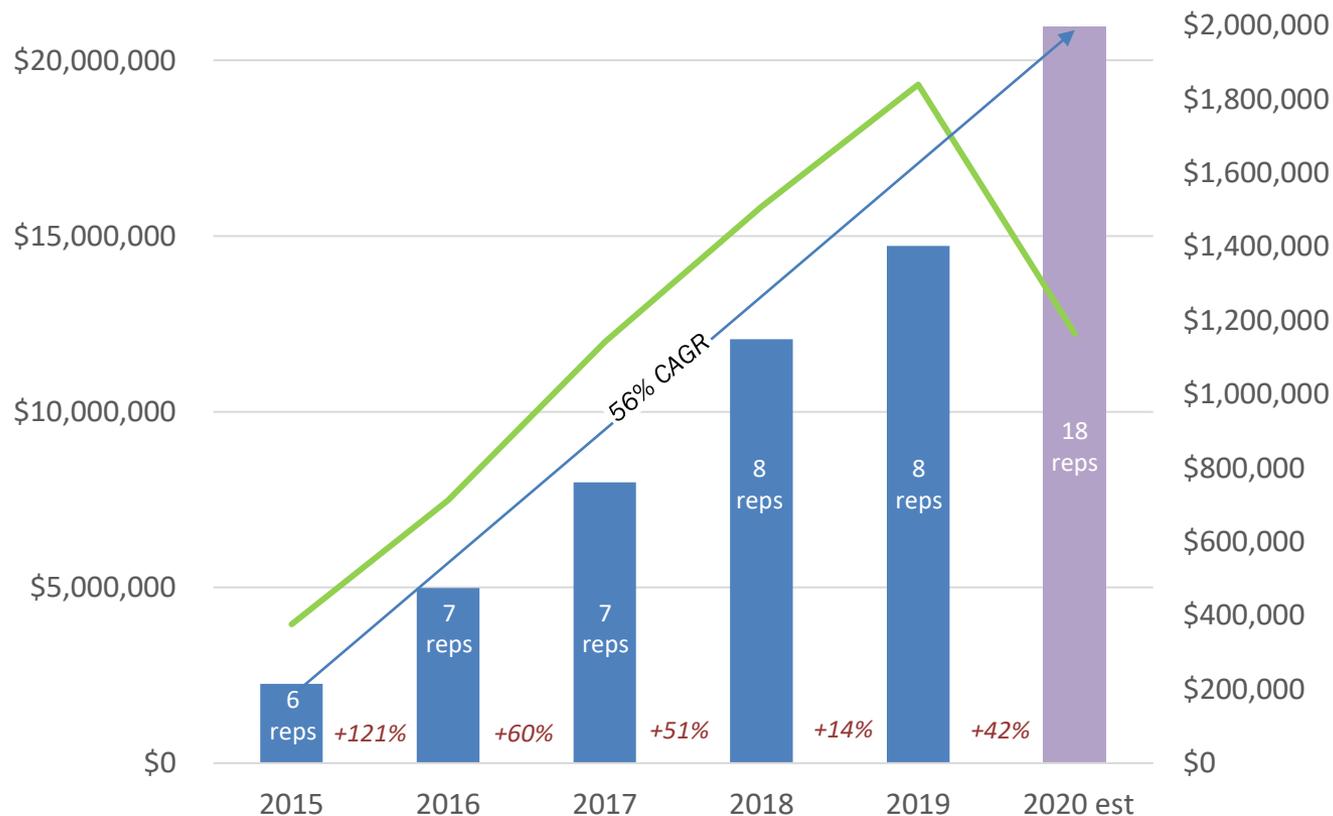
Direct Sales Focus on Germany

- Germany is the largest medical device market in the E.U. and the third largest in the world. The German market alone represents a \$1.0-1.5 billion total addressable market for CytoSorb
- CytoSorb has a strong foundation for growth in Germany
 - Outstanding sales team, including sales reps, product, technical, and clinical support
 - Strong key opinion leader support
 - Dedicated reimbursement supported by major medical societies
 - Penetration into hundreds of hospitals throughout the country
 - Multiple promising therapeutic applications



Catalyzing CytoSorb Sales in Germany

- In 2020, Germany accounts for ~50% of our overall product sales. Have now sub-divided Germany to shrink territories to allow maximization of revenue opportunity. Enables focus and growth of key accounts, increased efficiency due to shorter travel, and ability to detail small and mid-sized hospitals better
- For 2020, we have more than doubled Germany sales reps/specialists from 8 to 18. As COVID-19 fades, and reps are allowed back into hospitals, we expect productivity to increase from existing sales reps by focusing and growing key accounts, and rapid productivity for new reps, as they will start in active territories with sales



* estimated

EU Approval to Remove Ticagrelor and Rivaroxaban “Blood Thinners” During Cardiothoracic Surgery

CytoSorb has received E.U. approval to remove two well-known blockbuster “blood thinners” during cardiothoracic surgery, used in millions of patients to reduce risk of stroke and heart attacks



Ticagrelor (Brilinta[®], Brilique[®] - Astra-Zeneca) is a blockbuster P2Y₁₂ anti-platelet agent (“blood thinner”) with more than \$1.6 billion in worldwide sales, used in patients with acute coronary syndrome



Rivaroxaban (Xarelto[®] – Bayer, Janssen/J&J) is a blockbuster Factor Xa inhibitor anti-coagulant (“blood thinner”) with ~\$7 billion in 2019 global sales used as lifelong therapy in patients with atrial fibrillation

Problem: Patients that require emergent or urgent cardiothoracic surgery on these blood thinners can develop serious bleeding complications

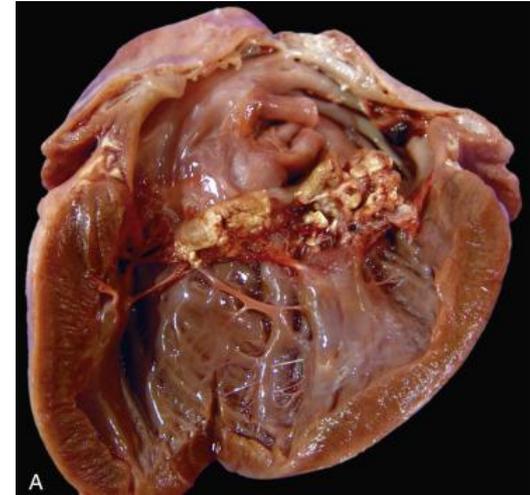
CytoSorb installs easily into a heart-lung machine or cardiopulmonary bypass machine and as blood flows through the cartridge, removes these drugs rapidly during surgery and >90% from whole blood in CPB simulations to reverse their anti-coagulant effect

We believe CytoSorb can quickly become a cost-effective standard of care to prevent bleeding due to anti-thrombotics, helping to drive sales growth



REMOVE Endocarditis Trial To Read Out Shortly

- Infective endocarditis (heart valve infection) occurs when bacteria seeds a heart valve from IV drug abuse and dirty needles, or from dental procedures
- The incidence of endocarditis is rising in the U.S. due to the opiate crisis and use of dirty needles
- Patients often require open heart surgery valve replacement but are very hemodynamically unstable before, during, and after surgery due to a combination of sepsis and heart valve destruction
- Outcomes are generally poor with hemodynamic instability, high mortality (~15%), many adverse events, and high cost (\$150-250,000 per case). Intraoperative CytoSorb has been used to help stabilize such patients peri-operatively with good success
- The German Federal Ministry of Education and Research has funded a 250 patient, 15-center, randomized, controlled, Good Clinical Practice (GCP), investigator-initiated trial (REMOVE) using CytoSorb during valve replacement open heart surgery in patients with infective endocarditis. The primary endpoint is improvement of SOFA score
- Trial completed in Jan 2020 with 250+ patients enrolled. Due to COVID-19 delays, top-line data is expected in 1H 2021. If positive, could establish CytoSorb as standard of care, and lay a path for potential U.S. approval



Liver Disease: Another Big Opportunity

- 850 million people suffer from chronic liver disease due to viral hepatitis, alcoholism, and non-alcoholic fatty liver (NASH), and other causes leading to 1 million deaths from chronic liver disease, and another 1 million from hepatic cancer
- Millions of chronic liver disease patients are hospitalized each year for an acute exacerbation of their chronic liver disease, often triggered by infection or alcohol, presenting with jaundice, organ failure, change in mental status, accumulation of fluid, and bleeding complications

CytoSorb is E.U. approved to remove bilirubin in patients with liver disease and is being viewed by many as a next generation liver dialysis therapy*

CytoSorb reduces bilirubin, bile acids, and ammonia, but unlike other extracorporeal liver therapies, it also reduces cytokines that play a major role in the acute exacerbations of chronic liver disease and alcoholic hepatitis, and has been used to reverse encephalopathy



Before



After



Jaundice from chronic liver disease

* CytoSorb is not yet approved in the U.S.

Expanding Manufacturing Capacity to \$300-400M

- Our current manufacturing facility has capacity for ~\$80M in sales
- Lead time to build out, qualify, and validate is approximately 2 years
- Based on projected growth, we are evaluating relocation options to increase manufacturing capacity by 5x to \$300-400M in annual sales
- Capital expenditures to build out facility is ~\$7M, an excellent ROI
- In addition to larger reactors, we are planning increased efficiency through more automation
- New facility is expected to significantly drive down COGS and expand margins beyond 85% due to volume manufacturing

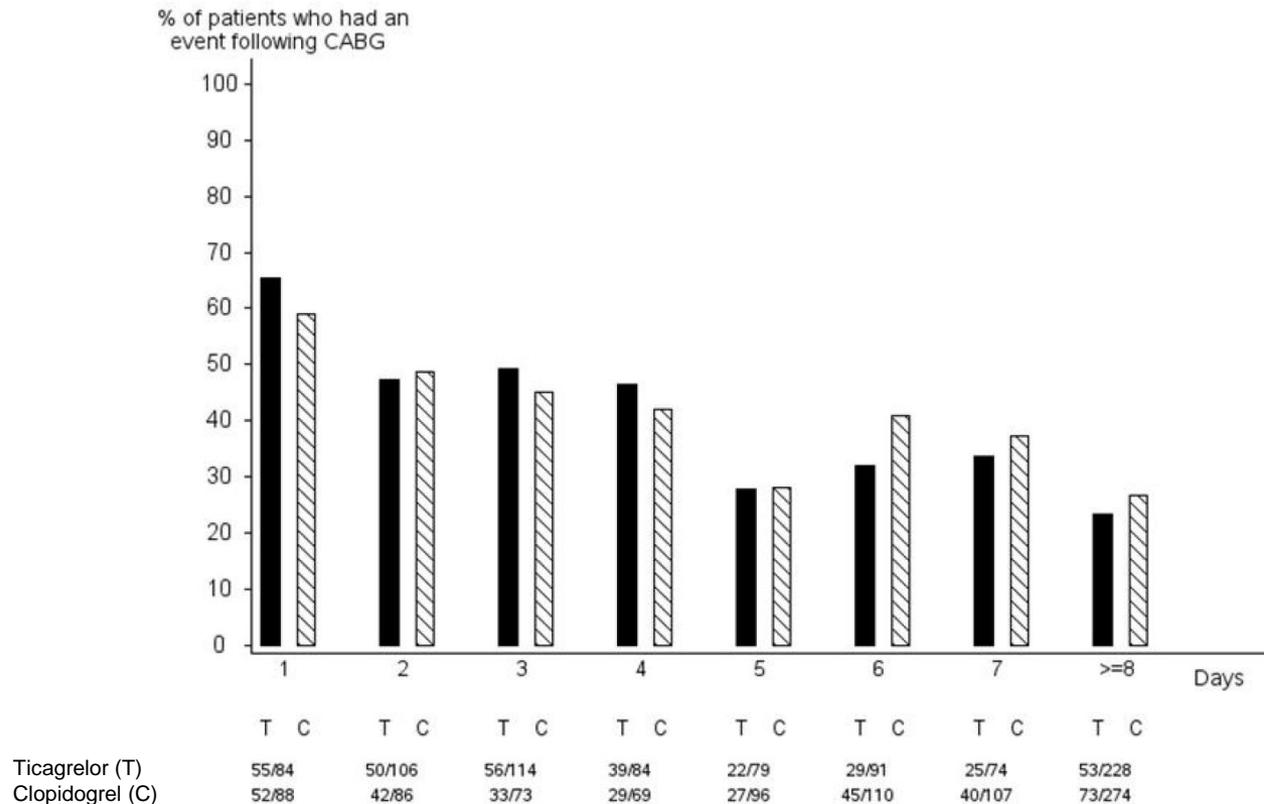


What is the U.S. Opportunity?

Risk of Bleeding Is High in CABG Patients on Ticagrelor

In the ticagrelor registration PLATO (PLAeLeT inhibition and patient Outcomes) trial, 1584 patients underwent CABG surgery, randomized between those who received either ticagrelor or clopidogrel. Those patients (%) with life-threatening bleeding are shown. Bleeding risk is high despite waiting up to 7 days off the drug prior to surgery

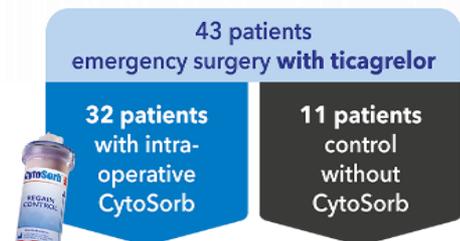
Figure 2 – ‘Major fatal/life-threatening’ CABG-related bleeding by days from last dose of study drug to CABG procedure (PLATO)



PLATO Major bleed, fatal/life-threatening: any major bleed as described above and associated with a decrease in Hb of more than 5 g/dL (or a fall in hematocrit (Hct) of at least 15%); transfusion of 4 or more units.

Fatal: A bleeding event that directly led to death within 7 days.

By Removing Drug, CytoSorb Reduces Bleeding Complications



CPB + CytoSorb
(n=32)

CPB alone
(n=11)

288 ± 63

353 ± 84

Procedure duration** (min; mean ± SD)

21.9% (n=7)

45.5% (n=5)

Red blood cell transfusion

34.4% (n=11)

100% (n=11)

Platelet transfusion

350 [300 - 450]

890 [630 - 1025]

Chest tube drainage
remove volume/24hrs (ml; median [IQR])

0% (n=0)

36.4% (n=4)

Re-thoracotomy

2 [1 - 3]

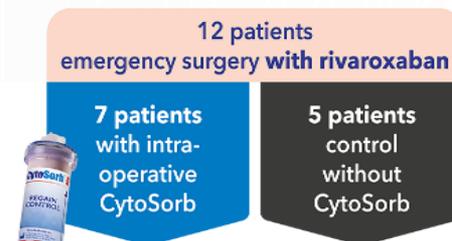
3 [2 - 4]

Days in intensive care (median [IQR])

11 [9 - 12]

14 [10 - 16]

Total length of stay (days; median [IQR])



CPB + CytoSorb
(n=7)

CPB alone
(n=5)

184 ± 97

309 ± 50

14.3% (n=1)

100% (n=5)

28.6% (n=2)

100% (n=5)

390 [310 - 430]

600 [590 - 1000]

0% (n=0)

40% (n=2)

2 [2 - 3]

6 [5 - 6]

11 [10 - 13]

18 [18 - 20]



In a separate analysis done in the U.K., this has translated into a projected cost savings to the hospital of approximately \$5,000 per patient, including the cost of CytoSorb

FDA Breakthrough Designation Sets Stage for Potential Expedited U.S. Regulatory Path



- In April 2020, the FDA granted Breakthrough Designation to CytoSorb to remove ticagrelor during cardiopulmonary bypass in emergent or urgent cardiothoracic surgery – a “fast track” for a major unmet medical need
- Met multiple times with FDA to present data to support CytoSorb as a low-moderate risk device
- Have now submitted an IDE application to conduct a the STAR-T (Safe and Timely Antithrombotic Removal of Ticagrelor) designed to support U.S. FDA approval
 - **Objective:** Demonstrate the clinical benefits of intraoperative ticagrelor removal
 - **Approach:** Multicenter study with high volume US cardiac surgery programs (majority of centers identified and agreed to participate)
 - **Study Organization:**
 - Sponsor: CytoSorbents
 - Operations: CytoSorbents clinical team + CRO
 - World renowned Principal Investigators and Executive Committee
 - **Upcoming Milestones:**
 - IDE approval anticipated Q2 2021
 - Study start anticipated Q3 2021
- We plan to have more detail on the study with IDE approval



United States TAM for Ticagrelor Removal

50,000 patients on ticagrelor needing emergent/urgent open heart surgery annually in US

X

\$5,000 per device

\$250 M Initial U.S. Total Addressable Market



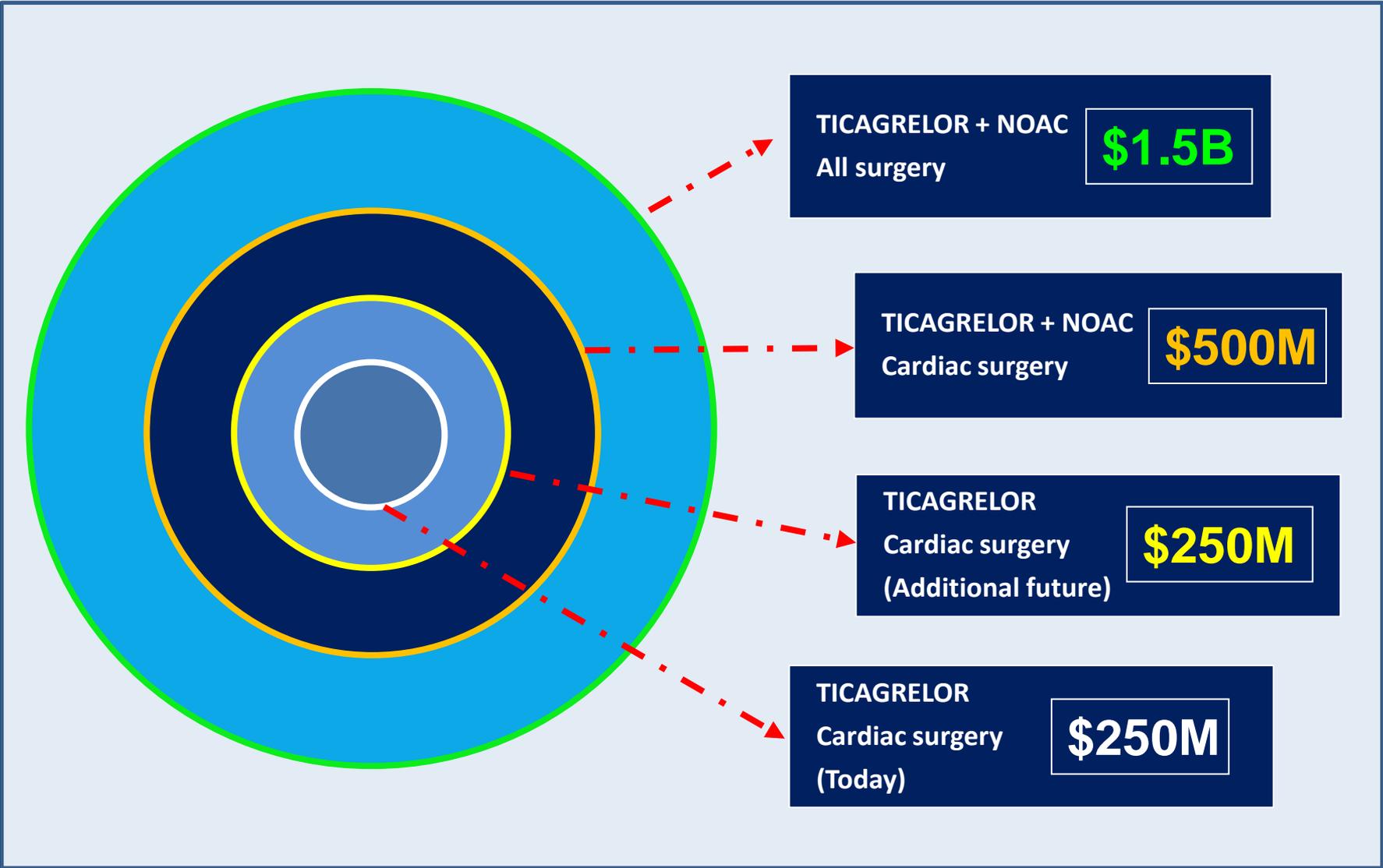
Ticagrelor market share expected to grow

- CytoSorb makes ticagrelor the only reversible platelet inhibitor
- Ticagrelor goes off patent in 2024 leading to drop in prices



\$500 M U.S. Total Addressable Market

Addressable U.S. Market For Current and Potential Future Indications for Antithrombotic Removal by CytoSorb



Preparing for U.S. Commercialization

- U.S. STAR-T trial is expected to provide both clinical and health economics data to support U.S. launch as well as sales for this application internationally
- Recently hired James Komsa as Vice President of US Sales and Marketing to initially manage U.S. COVID-19 sales, but to begin commercialization strategy and eventual build-out of sales and marketing team ahead of potential U.S. ticagrelor approval.
 - Former Vice President at Medtronic of the Restorative Therapy Group (RTG) and Pain, and former VP of Northeast Region, Cardiac and Vascular Group (CVG)
- New CMS approval of **Medicare Coverage of Innovative Technology** establishes automatic national Medicare coverage for Breakthrough Devices for 4 years
- Also recently hired David Cox as Vice President of Global Regulatory Affairs.
 - Former Vice President of Regulatory Affairs for Tissue and Regenerative Technologies at Integra LifeSciences
- Goal is to be prepared for U.S. launch at the time of potential FDA approval

Investment Summary

CytoSorbents has the potential to become a highly profitable elite performer in the therapeutics space with industry leading operating profit margins

- High margin razorblade business model with excellent operating leverage and a solid track record of ex-US growth
- Strong foundation and well-funded for potential future growth, with new and existing clinical applications that address major unmet medical needs
- Working to drive U.S. FDA approval by leveraging FDA Breakthrough Designation of CytoSorb for ticagrelor (Brilinta®) removal. Believe CytoSorb can rapidly become standard of care and capture an initial \$250M opportunity
- We have extensive validation from physicians around the world, leading strategic partners, U.S. government agencies, and the media
- Additional near-term catalysts could include new clinical data, clarity on U.S. regulatory path under Breakthrough Designation, sales progress, and many others



***Providing Hope
in a helpless situation***



HELPING PATIENTS SURVIVE CRITICAL ILLNESSES WORLDWIDE



CytoSorbents™

Working to Save Lives Through Blood Purification

NASDAQ: CTSO

Dr. Phillip Chan, MD, PhD – CEO

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