

# CytoSorbents™



HELPING REDUCE DEADLY UNCONTROLLED INFLAMMATION IN HOSPITALIZED PATIENTS WORLDWIDE

**NASDAQ: CTSO**  
Investor Presentation  
April 2021

# Safe Harbor Statement

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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](http://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, \$39.5M 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<sup>®</sup>

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

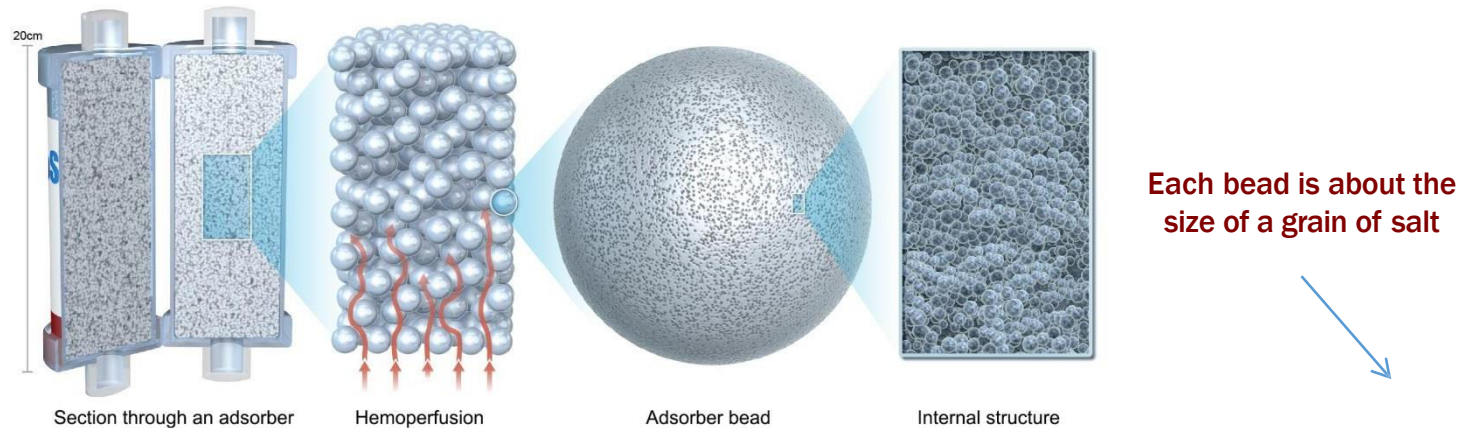
↑  
Improve  
Patient  
Outcome  
& Survival

↓  
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

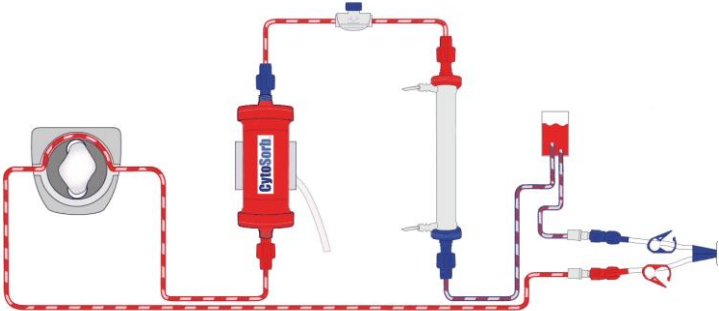


- Proprietary patented technology with 16 issued U.S. patents and multiple patents issued and pending worldwide
- Manufactured at our ISO 13485 certified facility in New Jersey

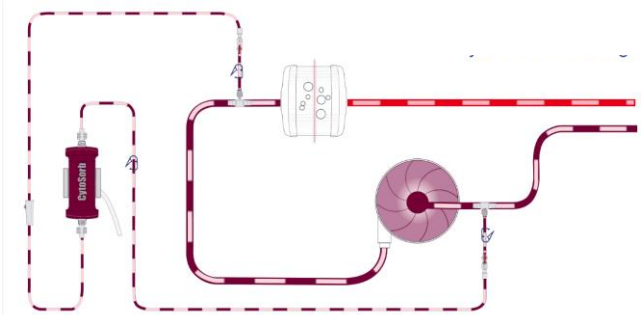
# CytoSorb is “Plug and Play” Compatible

## Compatible with Existing Blood Pump Infrastructure In Hospitals Today

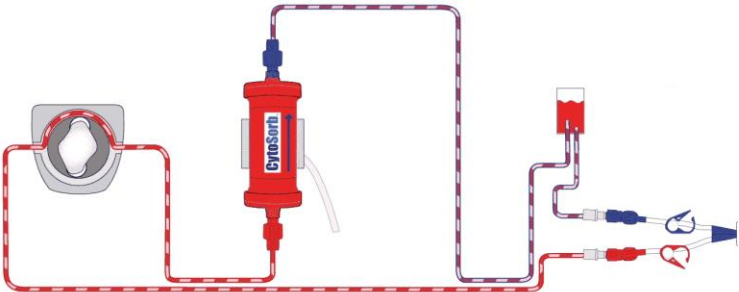
**Dialysis or CRRT**  
(Continuous Renal Replacement Therapy)



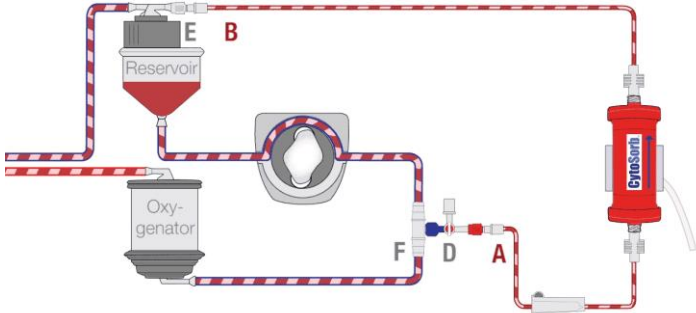
**ECMO**  
(Extracorporeal Membrane Oxygenation)



**Hemoperfusion**  
(Standalone Treatment)



**CPB**  
(Cardiopulmonary Bypass)





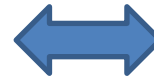
What is the Company's  
Business model  
and  
Financial performance?

# CytoSorbents Has a Strong Hybrid Sales Model

67 Countries Worldwide and 121,000+ treatments

Critical Care and Cardiac Surgery

Direct Sales

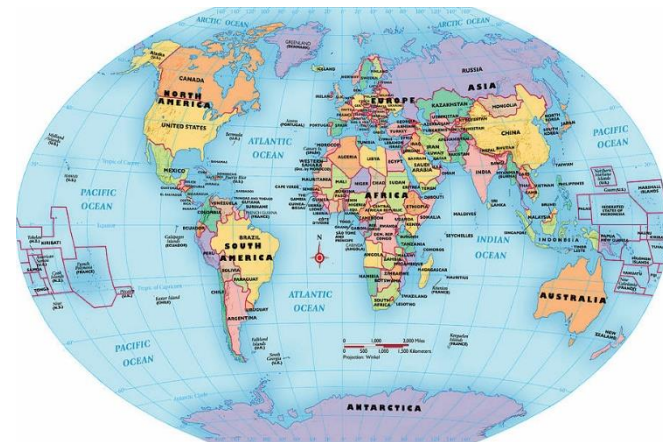


Distributor and Partner Sales



Direct sales in 10 countries:

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

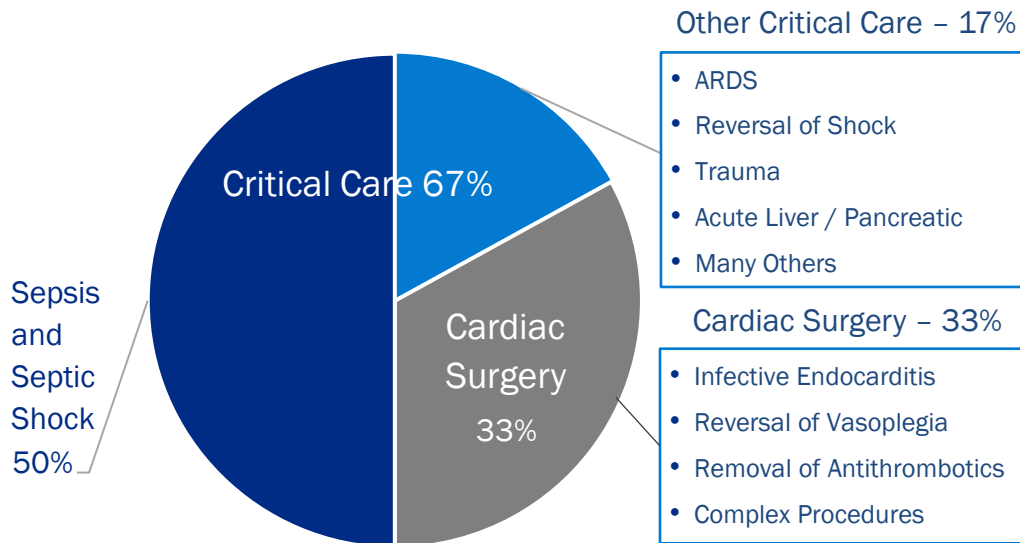


Distributor and Partner sales in 57 other countries

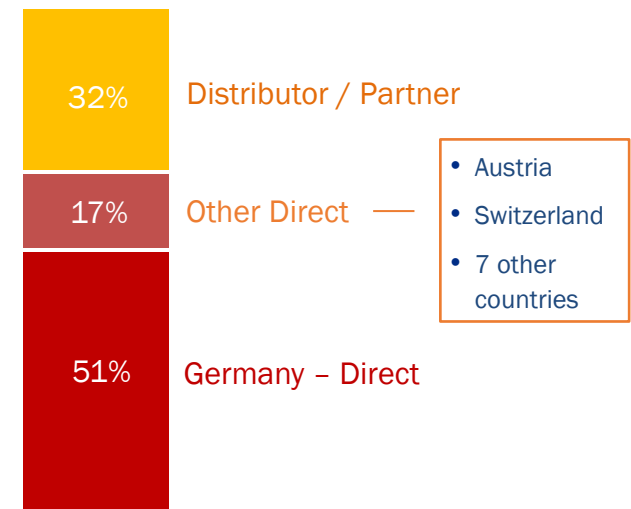
Entered U.S. under FDA EUA, added Mexico and South Korea with partner, Fresenius Medical Care, and expanded extensively in Latin America

# CytoSorb Commercialization Focus

## By Market



## By Geography



2020

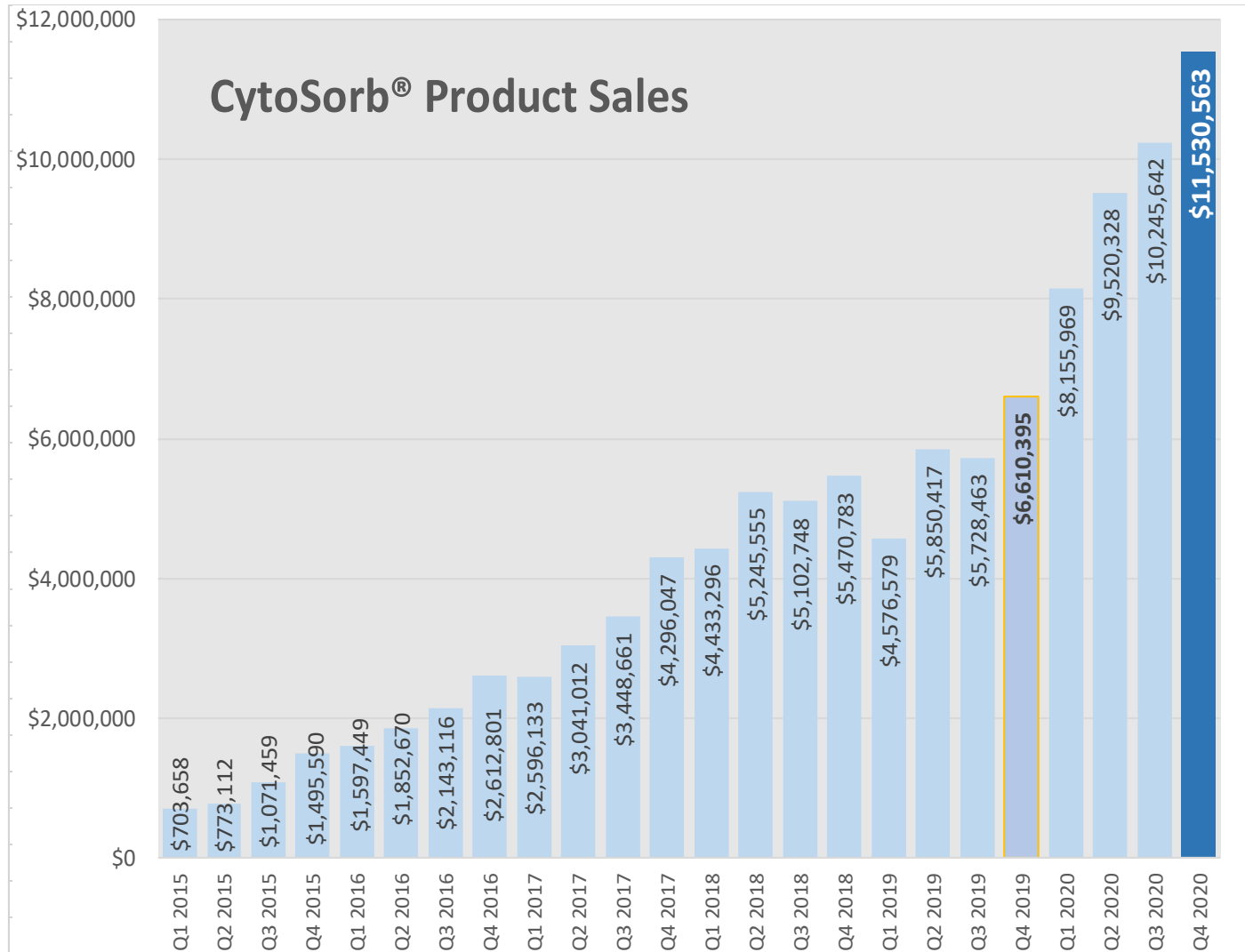
# CytoSorb Is a High Margin “Razorblade”

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- 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

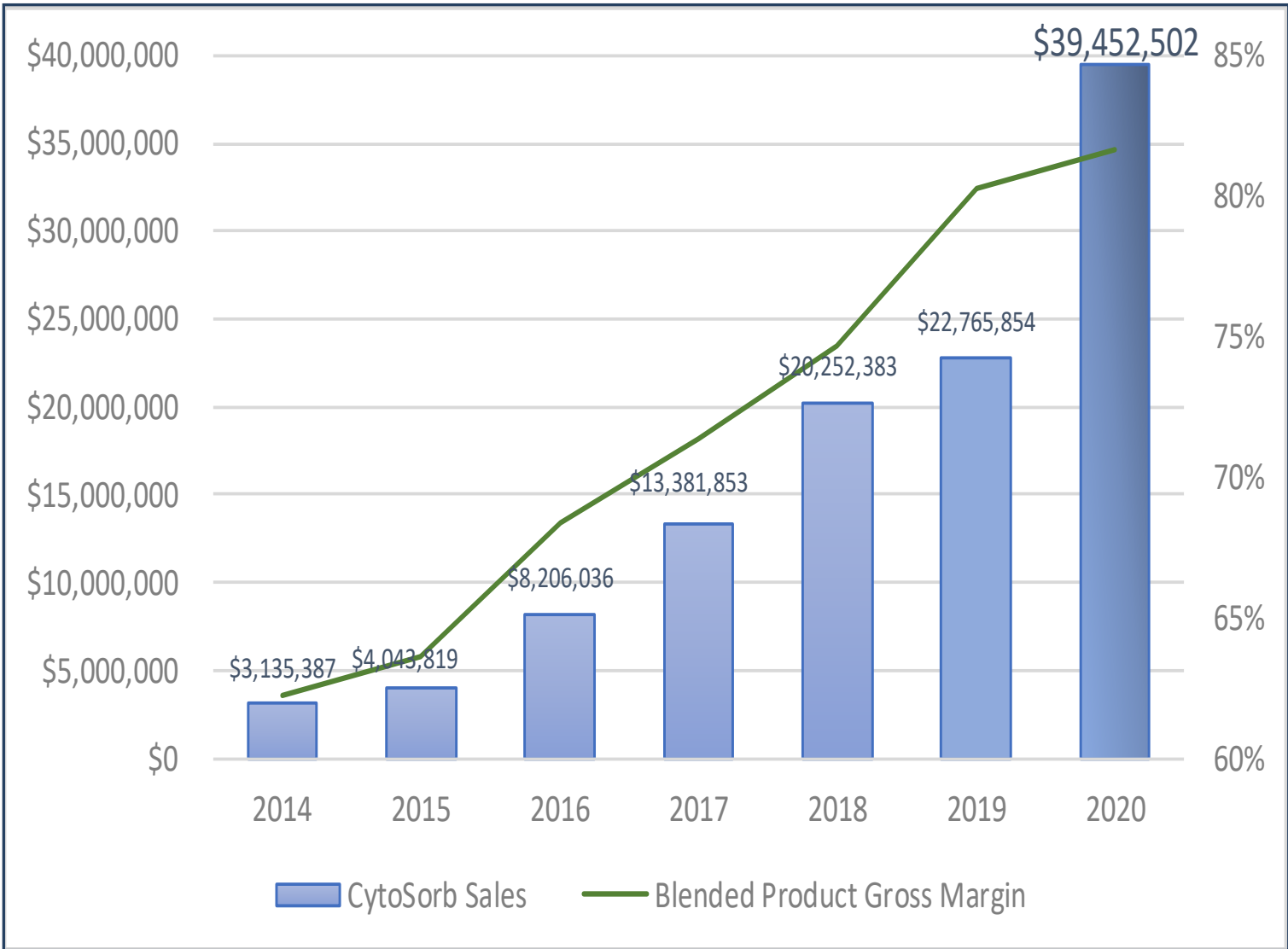
# Quarterly Product Sales

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

I N V E S T M E N T

# 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

# Expanding Manufacturing Capacity to \$300-400M

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- 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

# Expanded Workforce from 105 to 200 in 2+ Years



November 2018



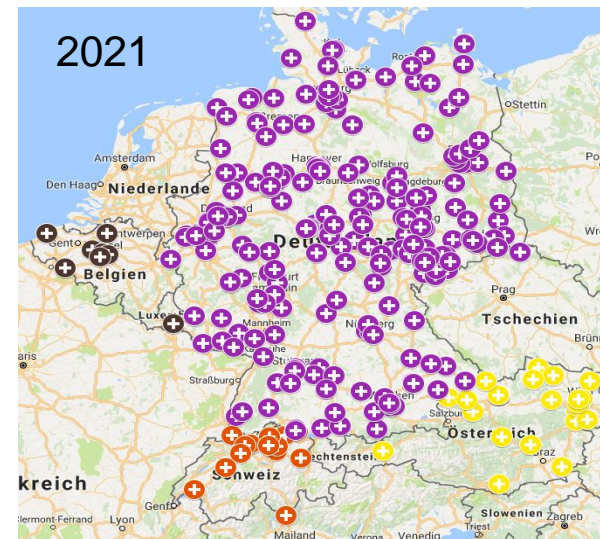
Increased headcount focused heavily on commercialization and manufacturing to drive growth

February 2021



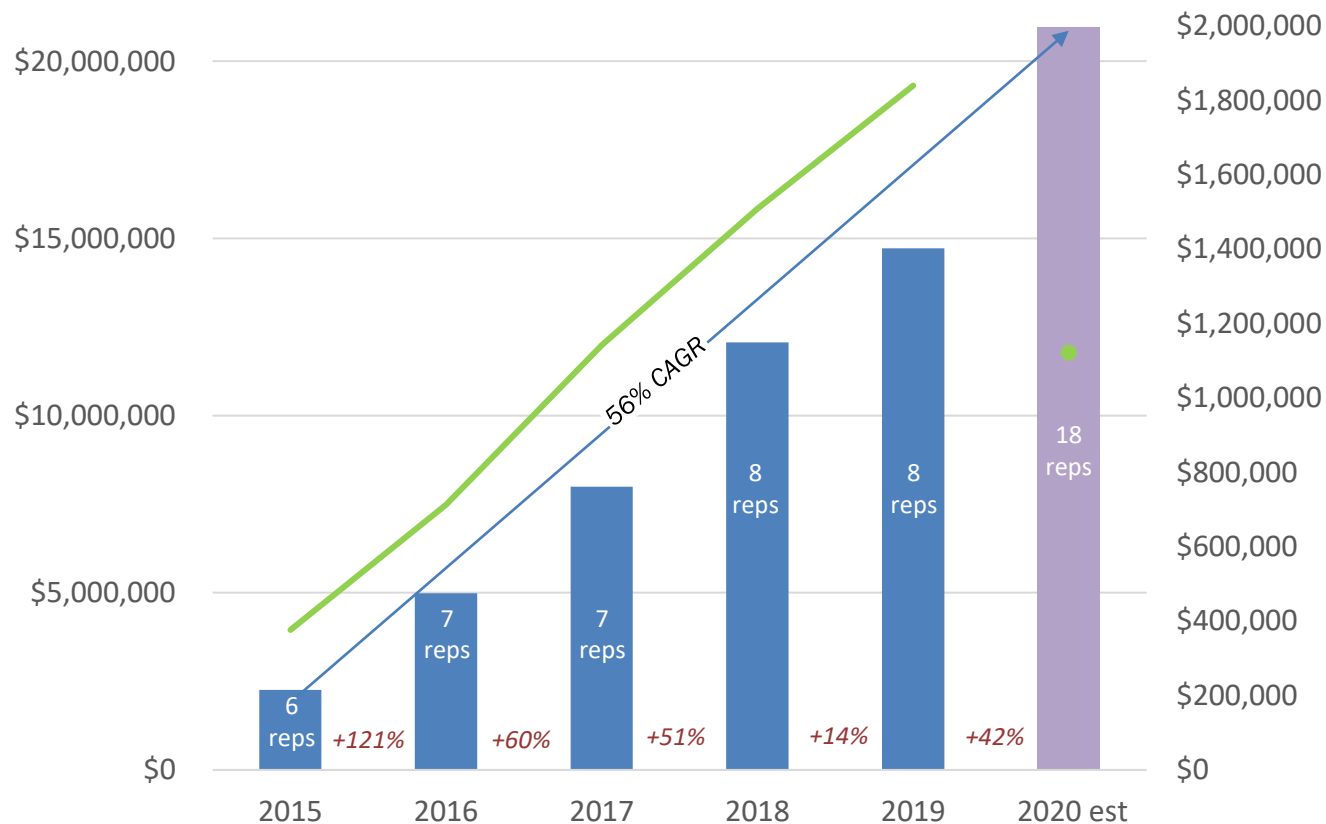
# Direct Sales Focus on Germany

- 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<sup>®</sup>, Brilique<sup>®</sup> - Astra-Zeneca)** is a blockbuster P2Y<sub>12</sub> anti-platelet agent (“blood thinner”) with more than \$1.6 billion in worldwide sales, used in patients with acute coronary syndrome



**Rivaroxaban (Xarelto<sup>®</sup> – 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

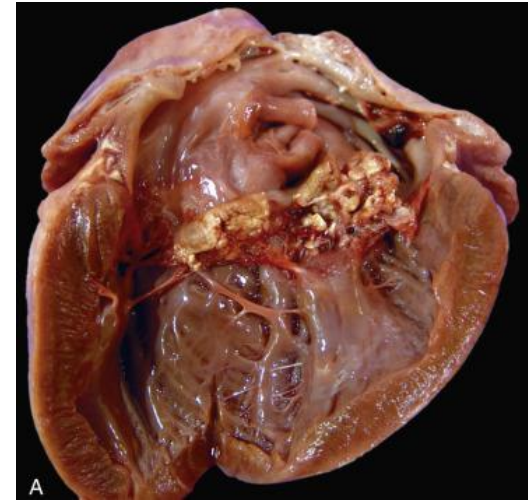
We believe CytoSorb can quickly become a cost-effective standard of care to prevent bleeding due to anti-thrombotics, helping to drive sales growth





# 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 or acute hepatitis, 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.

# CytoSorb + ECMO: Novel Lung Rest Strategy to Treat ARDS

CytoSorb, in combination with extracorporeal membrane oxygenation (ECMO), represents a novel and potentially effective **lung resting or lung preservation strategy** to treat acute respiratory distress syndrome (ARDS) by providing gas exchange and inflammatory toxin reduction, allowing the lungs to heal

Dr. Robert Bartlett - Pioneer of ECMO and former CytoSorbents Chief Medical Officer for 10 years) suggests the following may be helpful in COVID-19 patients on ECMO (paraphrased):



If possible, let ECMO do the work of gas exchange

Allow true lung rest and avoid ventilator-induced lung injury

The goal of cytokine adsorption with CytoSorb + ECMO in ARDS patients is to promote lung healing – a requisite to potentially faster weaning from mechanical ventilation and decannulation from ECMO

# CytoSorb: Pneumogenic Sepsis, ARDS & ECMO

## Combined Use of CytoSorb and ECMO in Patients with Severe Pneumogenic Sepsis

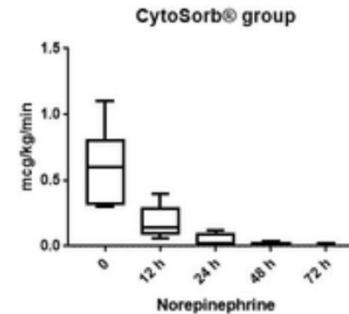
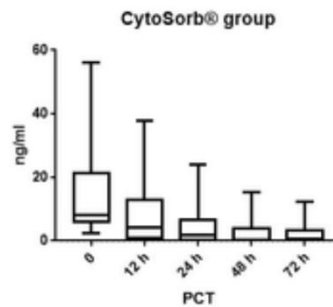
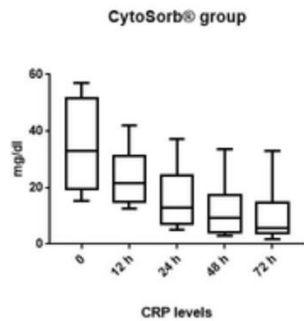
Ali Akil<sup>1</sup> Stephan Ziegeler<sup>2</sup> Jan Reichelt<sup>1</sup> Stephanie Rehers<sup>2</sup> Omer Abdalla<sup>1</sup> Michael Semik<sup>1</sup> Stefan Fischer<sup>3</sup>

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<sup>3</sup> Department of Thoracic Surgery and Lung Support, Ibbenbueuren General Hospital, Ibbenbueuren, Germany

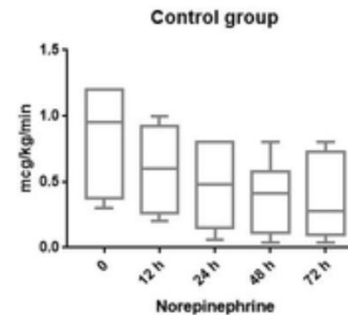
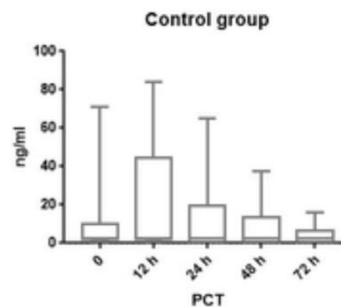
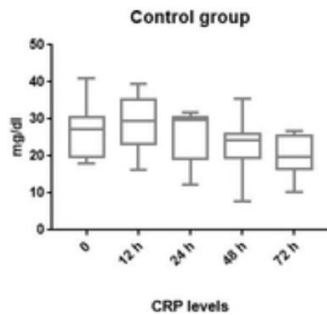
Address for correspondence: Dr. med. Ali Akil, Department of Thoracic Surgery and Lung Support, Klinikum Ibbenbueuren, Grosse Strasse 41, Ibbenbueuren 49477, Germany (e-mail: dr.ali.akil.11@gmail.com).

All patients received at least 2 CytoSorb cartridges and a maximum of 3 with ECMO and changed every 24 hours. Blood flow rates were 200-400 mL/min

- 13 patient prospective study (vs. No CytoSorb historical control; n=7)
  - Pneumogenic sepsis (3 influenza, 1 fungal, 9 bacterial)
  - ARDS and vv-ECMO treated with CytoSorb
  - Shock with norepinephrine > 0.3 µg/kg/min, lactate > 2.0 mmol/L; PCT > 1 ng/ml
- Time to Intervention: **within 6 hours after admission on ICU, and within 12 hours from sepsis diagnosis**
- SAPS II: CytoSorb: 58±2 (range 49-66; predicted mortality > 60%) vs 50±2 (range 42-55; predicted mortality > 50%)

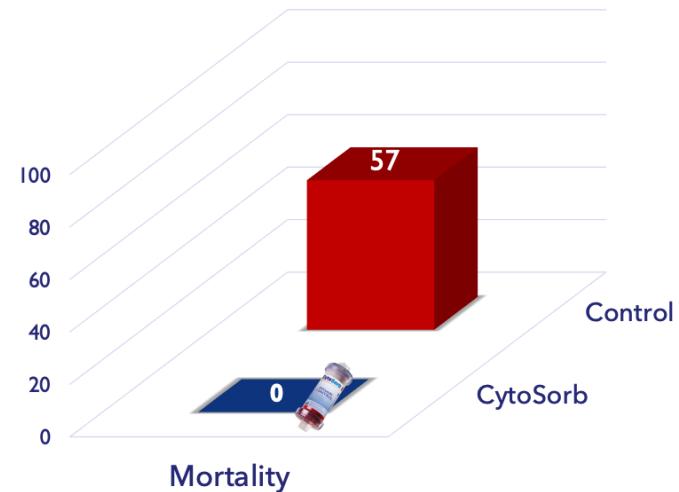


n = 13



Control  
n = 7

# CytoSorb: Pneumogenic sepsis, ARDS & ECMO



- Use of CytoSorb was rapid: within 6 hours of ICU admission and 12 hours of sepsis diagnosis
- CytoSorb use resulted in rapid hemodynamic stabilization
- Mean duration of ECMO: CytoSorb:  $8 \pm 2$  days (range 2-23 days) versus  $19 \pm 3$  days (range 13-30 days). Mean time to ECMO decannulation was 5 days after the last CytoSorb dose
- Mean ICU stay: CytoSorb:  $26 \pm 6$  days (range 7-63 days) versus  $26 \pm 5$  days (range 8-43 days), possibly impacted by survival bias
- 30-day mortality rate: 0% treatment vs 57 % control. All CytoSorb treated patients were alive at 60 days  
Cause for death in control patients was sepsis with multi-organ failure

# CytoSorb is FDA Emergency Use Authorized

**CytoSorb is an extracorporeal cytokine adsorber that has been granted FDA Emergency Use Authorization (EUA) in the COVID-19 Pandemic**

[Under the EUA\\*](#), CytoSorbents can make CytoSorb available, through commercial sales, to all hospitals in the United States for use in patients, 18 years of age or older, with confirmed COVID-19 infection who are admitted to the intensive care unit (ICU) with confirmed or imminent respiratory failure who have:

- Early acute lung injury (ALI)/early acute respiratory distress syndrome (ARDS); or
- Severe disease, defined as:
- Life-threatening disease

The CytoSorb device has neither been cleared nor approved for the indication to treat patients with COVID-19 infection.

The CytoSorb device is authorized only for the duration of the declaration that circumstances exist justifying the authorization of the emergency use of the CytoSorb device under Section 564(b)(1) of the Act, 21 U.S.C § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.

# Global COVID-19 CytoSorb Activity

CytoSorb has been used in ~5,000 COVID-19 Patients in 30+ countries. As an E.U. approved extracorporeal cytokine adsorber, more than 121,000 treatments have been delivered to date

## CytoSorb COVID-19 status in other selected countries:



CHN – Handbook of COVID-19 Prevention and Treatment



COL – Expert consensus - Colombian Journal of Nephrology



GBR – Medtech Innovation Briefing published by NICE



GER – Treatment of severe COVID-19 courses in intensive care medicine



IND – Cytokine Storm in COVID-19 Expert Management Considerations



ISR – AMAR approval



ITA – Brescia Renal COVID-19 Task Force Recommendations



PAN – National Guidelines on adult COVID-19 patients



CAN – Medical Device Authorization



CytoSorb Therapy - REGAIN CONTROL

# CytoSorb in COVID-19: CRRT or Hemoperfusion

## Case Series on Mechanical Ventilation

Evidence 128 CYTOSORB patients	Saudi-Arabia Alharthy Artif Organs 2020	Iran Nassiri Webinar 10/29/20	Ecuador Lopez-Almaraz Webinar 10/29/20	Italy Riva Webinar 4.16.20	Germany Nierhaus Webinar 10.29.20	Spain Ferrer Webinar 5/20/20	Italy Rampino Blood Purif 2020
# patients	50	26	25	11	5 v 5	7	5 vs 4
# patients on HP / CRRT / ECMO	0/50/0	7/19/0	12/13/0	0/11/0	n/r	0/5/2	5/0/0
Inflammatory mediators ↓	✓	✓	✓	✓	✓	✓	(✓)
Hemodynamic stabilization ↑	✓	✓	✓	n/a	✓	n/r	n/a
Respiratory Function ↑	✓	✓	✓	✓	n/r	✓	✓
Survival	70% (APACHE 2: 22) (SOFA 9)	81% (APACHE 2: 28)	n/r	82% CYTO vs. 70% control	n/r	71% (SOFA: 9)	80% CYTO vs. 0%

n/r: not reported n/a: not applicable



# CytoSorb in COVID-19: ECMO

## COVID-19 Case Series on ECMO

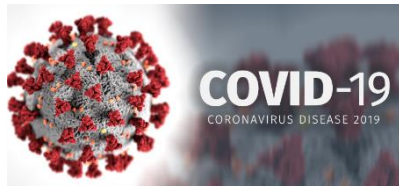
## Non COVID-19 ECMO

Evidence 57 CYTOSORB + ECMO patients	Germany Rieder Crit Care 2020	France Lebreton Am J Resp Crit Care 2021	U.S. Durham Pers. Comm	U.S. Moazami Webinar 6.25.20
# patients	4 v 4	<b>11 propective</b> vs 11 historical control	10 v 20	10 v 20
# patients on HP / CRRT / ECMO	0/0/4	0/0/11	0/0/10	0/0/10
Inflammatory mediators ↓	✓	✓	✓	✓
Hemodynamic stabilization ↑	✓	✓	n/r	✓
Respiratory Function ↑	✓	✓	✓	✓
Survival	n/r	<b>73% CYTO</b> vs 64% control	<b>80% CYTO</b> vs 80% control	<b>90% CYTO</b> vs 90% control

Germany Akil Thoracic CV Surgery 2020	Rieder ASAIO J 2021
<b>13 propective</b> vs 7 historical control	<b>9 registry</b> vs 9 propensity scored control
0/0/13	0/0/9
✓	✓
✓	✓
✓	n/r
<b>100% CYTO</b> vs 43% control	<b>56% CYTO</b> vs 22% control

n/r: not reported n/a: not applicable

# Unlocking the U.S. Opportunity



REFRESH 2-AKI  
Pivotal Trial



# U.S. REFRESH 2-AKI Pivotal Trial

- The U.S. REFRESH 2-AKI pivotal trial is a 400-patient, 25 center pivotal RCT designed to support U.S. regulatory approval as a prophylactic therapy used during complex open heart surgery such as valve replacement and aortic reconstructive surgery to reduce the severity or incidence of acute kidney injury (AKI) following surgery
- The development of post-operative AKI is associated with increased mortality up to 5 years post-op and a risk of developing renal failure requiring dialysis
- CytoSorb is used intra-operatively during cardiac surgery to reduce inflammatory toxins such as free hemoglobin, activated complement and cytokines that can lead to AKI
- Currently 153 patients enrolled with recent favorable review of safety data by the Data Monitoring Committee
- Have been conducting multiple activities to resume study in Q2 2021, pending a lifting of COVID-19 restrictions



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



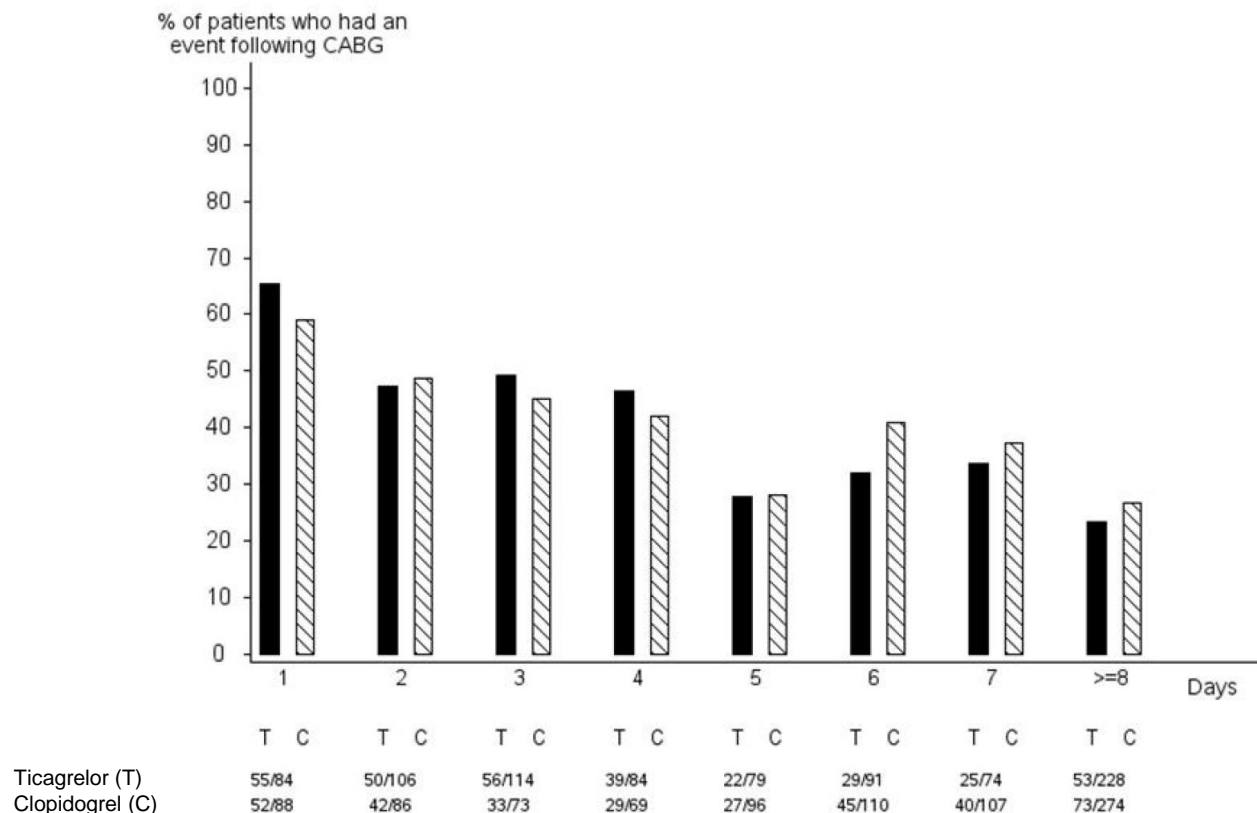
- In April 2020, the FDA granted Breakthrough Designation to CytoSorb to remove ticagrelor during cardiopulmonary bypass in emergent or urgent cardiothoracic surgery – a “fast track” for a major unmet medical need
- Met multiple times with FDA to present data to support CytoSorb as a low-moderate risk device
- Filed IDE application in mid-March 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



# 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)**

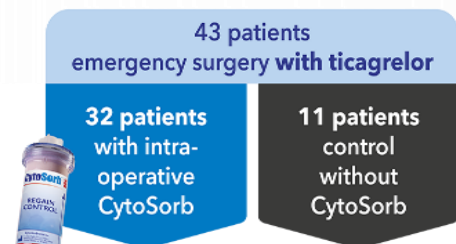


**PLATO Major bleed, fatal/life-threatening:** any major bleed as described above and associated with a decrease in Hb of more than 5 g/dL (or a fall in hematocrit (Hct) of at least 15%); transfusion of 4 or more units.

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

\* Astra Zeneca Prescribing Information for Ticagrelor  
 PLATO Trial: Wallentin, L. et al. Ticagrelor versus clopidogrel in patients with acute coronary syndromes, NEJM 2009 Sep 10; 361(11):1045-57.

# 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]

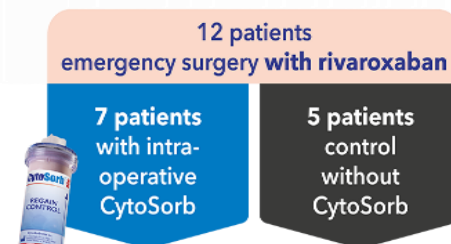
3 [2 - 4]

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

# 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**



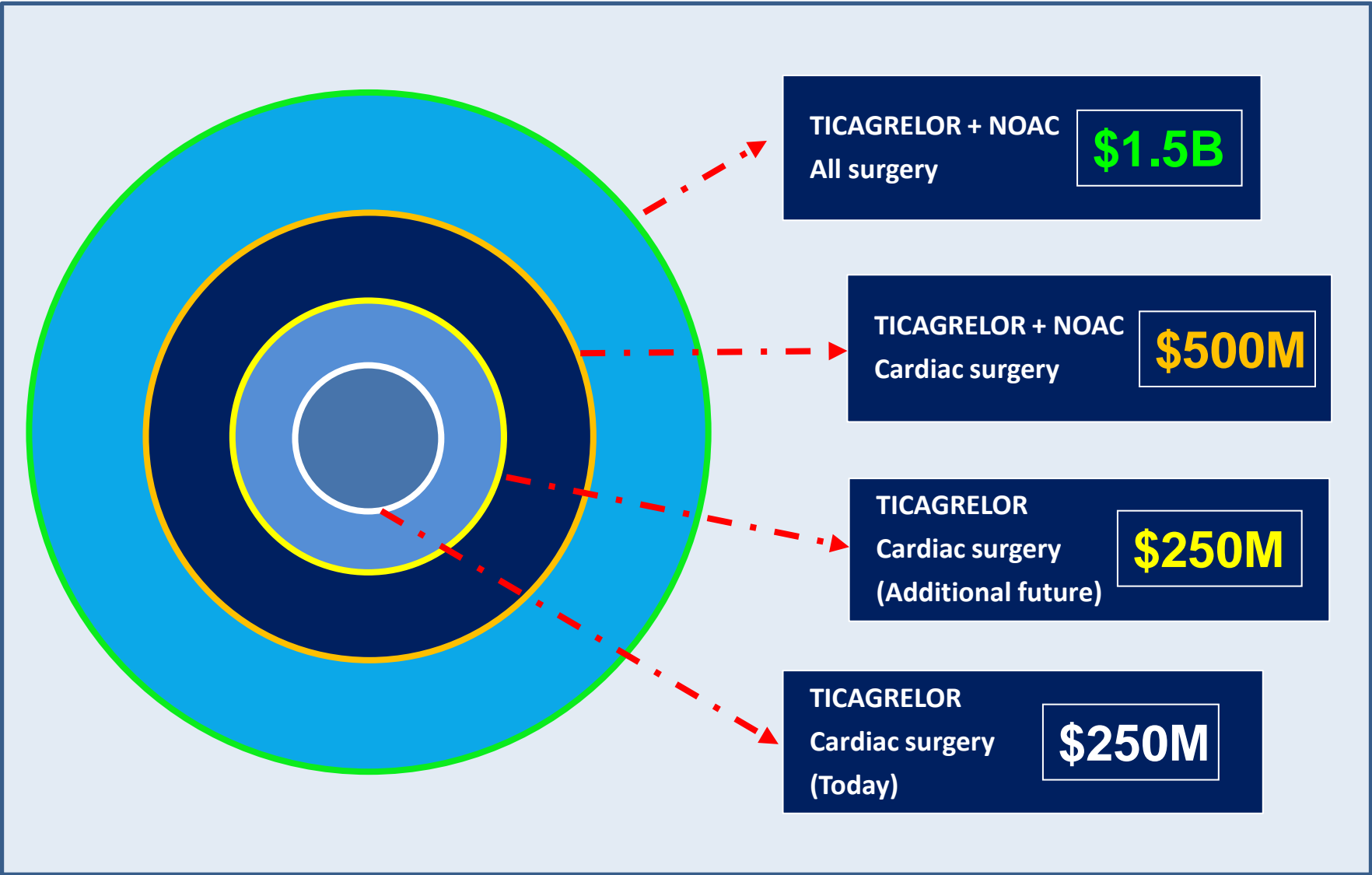
**Ticagrelor market share expected to grow**

- 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

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- 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

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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

[pchan@cytosorbents.com](mailto:pchan@cytosorbents.com)

# CytoSorb in COVID-19 References

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