2019 Annual Meeting of Shareholders

(NASDAQ: CHFS)
May 23, 2019

For Investor Purposes Only: Not For Product Promotion

Safe Harbor Statement

This presentation contains forward-looking statements. All forward-looking statements are management's present expectations of future events and are subject to a number of risks and uncertainties. Various factors could cause actual results to differ materially from these statements including our ability to execute on our commercial strategy and to grow our Aquadex FlexFlow® business, our post-market clinical data collection activities, benefits of our products to patients, our expectations with respect to product development and commercialization efforts, our ability to increase market and physician acceptance of our products, potentially competitive product offerings, intellectual property protection, our expectations regarding anticipated synergies with and benefits of the Aquadex FlexFlow business, and the other risks set forth under the caption "Risk Factors" and elsewhere in our periodic and other reports filed with the U.S. Securities and Exchange Commission ("SEC"), including our Annual Report on Form 10-K for the fiscal year ended December 31, 2018. We are providing this information as of the date of this presentation and do not undertake to update any forward-looking statements contained in this presentation as a result of new information, future events or otherwise. Although the Company believes that the forward-looking statements are reasonable and based on information currently available, it can give no assurances that the Company's expectations are correct. All forward looking statements are expressly qualified in their entirety by this cautionary statement.

This presentation also contains estimates and other statistical data made by independent parties and by us relating to market shares and other data about our industry. These data involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates.

Our Vision

Changing the Lives of Fluid Overloaded Patients with a Clinically Proven Therapy

- Our mission is to improve the quality of life for patients suffering from fluid overload in acute and chronic conditions
- Through our commercial expansion efforts, we strive to be the global leader in fluid management solutions

Significant Worldwide Market Opportunity

Cardiovascular Surgery (CV surgery)

- Over 7 million cardiovascular operations and procedures are performed each year in the US[1], including:
  - 340,000 coronary artery bypass graft (CABG) procedures[2]
  - 180,000 valve procedures[3]
  - 4,000 ventricular assist device (VAD) implants[4]

Pediatrics

- Approximately 12,000 pediatric patients with heart failure[5] and ~29,000 receiving cardiac surgery, ECMO therapy, renal replacement, and solid organ transplants[6]

Heart Failure (HF)

- Over 6 million people suffer from HF in the US[7]
- 1 million patients hospitalized per year in the US for HF[8]
- 90% of HF patient hospitalizations are due to fluid overload[8]
- 68% show sub-optimal response to diuretics[9]

Worldwide
market opportunity
estimated at
3x US market[9]

1. 1. Circulation. 2014 January 21; 129(3): e28–e292. 2. https://idataresearch.com/new-study-shows-approximately-340000-cabg-procedures-per-year-in-the-united-states/. 3. https://idataresearch.com/over-182000-heart-valve-replacements-per-year-in-the-united-states/. 4. https://www.mdedge.com/chestphysician/article/148584/heart-failure/lvad-use-soars-elderly-americans . 5. Jayaprasad. Heart Views. 2016 Jul-Sep; 17(3): 92–99. 6. See slide 11 for references. 7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494150/. 8. Costanzo MR, et al. J Am Coll Cardiol. 2017;69(19):2428-2445. 9. Testani JM, et al. Circ Heart Failure. 2016;9(1).

The Market is Pulling Us Beyond Our Initial Target Segment

Market-Driven Approach

CV Surgery

- VAD
- CABG
- Valve Replacements
- Transplants

Pediatrics

- Renal Replacement
- Heart Disease
- Cardiac Surgery
- Transplants
- ECMO

Heart Failure

- Inpatient
- Outpatient

New

*Subject to FDA clearance of label modification

Leveraging Acute Need in CV Surgery for Chronic Need in Heart Failure

ACUTE NEED

CV Surgery

- CV Surgery offers *attractive market entry point*:
  - Surgeons generally possess a lot of "power" to initiate new therapies
  - Tech savvy nurses/staff
  - Patients already anticoagulated and have venous access line placed
  - Fluid-in/fluid out known

CHRONIC NEED

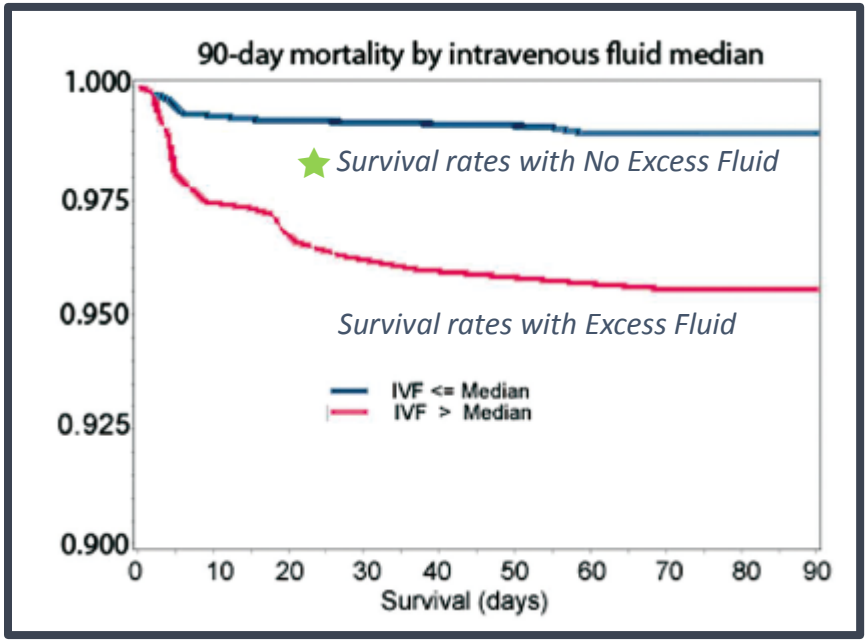
Heart Failure

- CV Surgeons can help Aquadex FlexFlow gain a foothold in hospitals
- Leverage surgical use to further penetrate heart failure market opportunity

Acute Need in Cardiac Surgery: Fluid Overload is Associated with Greater Mortality

Fluid Overload is Associated with 300% Increase in 90 Day Mortality Rates Post CV Surgery

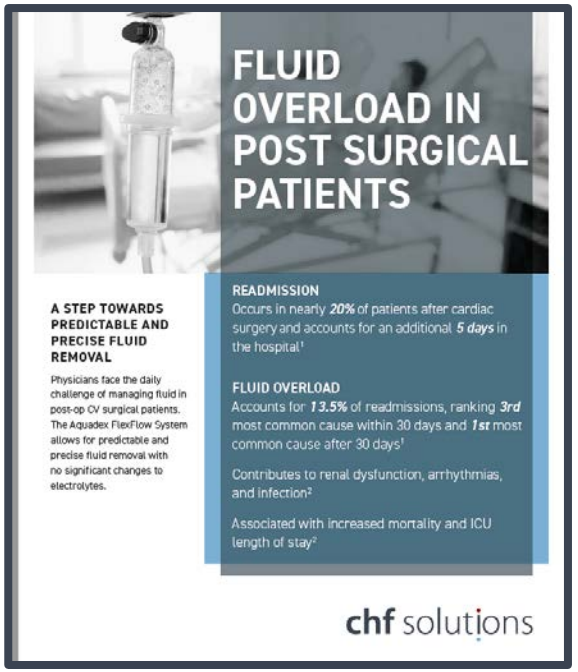
- Retrospective analysis on 1,358 patients who underwent cardiac surgery
- Greater amount of IV fluid during cardiac surgery associated with *three-fold increase* is mortality at 90 days



Source: Pradeep, A. et al. HSR Proc IC and Car An. 2010 Mar; 2(4): 287-296

Aquadex FlexFlow® Provides Significant Clinical and Economic Benefits in CV Surgery

- Modified ultrafiltration reduces duration of assisted ventilation post cardiac surgery[1,2,3]
- Aquadex FlexFlow not considered renal replacement therapy from a quality reporting standpoint
- No Nephrology consultation required to prescribe Aquadex FlexFlow



1.Luciani GB, et al. Circulation. 2001 Sep 18;104(12 Suppl 1): I253-I259. 2. Kiziltepe, U, et al. Ann Thorac Surg. 2001 Feb;71(2): 684-93. 3. Grunenfelder et al. Eur J of Cardio-Thoracic surgery.2000; 17:77-83.

Pediatrics: Providing a Solution in an Underserved Market

- Aquadex FlexFlow/ultrafiltration is currently being prescribed by physicians to treat various pediatric conditions:

Acute

- Kidney replacement therapy for neonatal patients (11,000 patients/yr) [1]
- Cardiac surgery (10,000 procedures/yr) [2]
- Extracorporeal membrane oxygenation (ECMO) therapy (6,000 procedures/yr) [3]
- Solid organ transplantation (2,000 procedures/yr) [4]

Chronic

- Heart Disease (12,000 patients/yr) [5]

- Q3 2019 510(k) filing with FDA for Pediatric Indication

1. https://www.ncbi.nlm.nih.gov/pubmed/23833312
2. https://www.cdc.gov/ncbddd/heartdefects/data.html
3. https://www.ncbi.nlm.nih.gov/pubmed/23246046.
4. https://www.organdonor.gov/about/donors/child-infant.html.
5. http://www.heartviews.org/article.asp?issn=1995-705X;year=2016;volume=17;issue=3;spage=92;epage=99;aulast=Jayaprasad

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Significant Opportunity in Heart Failure For Outpatient Setting

VA/Department Of Defense Opportunity

- Goal of VA/DOD health systems is to avoid HF hospital admissions
- Tampa VA conducting clinical study on outpatient use of Aquadex FlexFlow
  - Q3 2019 initiation
- $6.5M blanket purchase agreement received for outpatient trial at Tampa VA

Hospital and Health System Opportunity

- Goal is to manage HF patients proactively to avoid 30 day readmissions
- 2 hospitals currently offering Aquadex FlexFlow therapy in an outpatient setting:
  - Christ Hospital in Cincinnati
  - Medstar Good Samaritan in Baltimore

James Haley Veterans' Hospital and Clinics Tampa

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We Are Evaluating New Predictive Diagnostic Tools

- Physicians need new diagnostic tools to better manage fluid overload to:
  - Assess which patients are best candidates for ultrafiltration
  - Target how much fluid to remove
  - Know when the patient is approaching dry weight and to discontinue ultrafiltration
- We are evaluating diagnostic technology internally and with partners:

Daxor Corporation: (NYSE: DXR) Daxor is providing clinically-proven blood volume analysis

NIMedical, Inc.: NIMedical has developed new capabilities in using bio-impedence to assess fluid levels in humans

AcQtrac System, acquired in mid-2018: designed to noninvasively provide real-time measurements of hemodynamic parameters in fluid overload

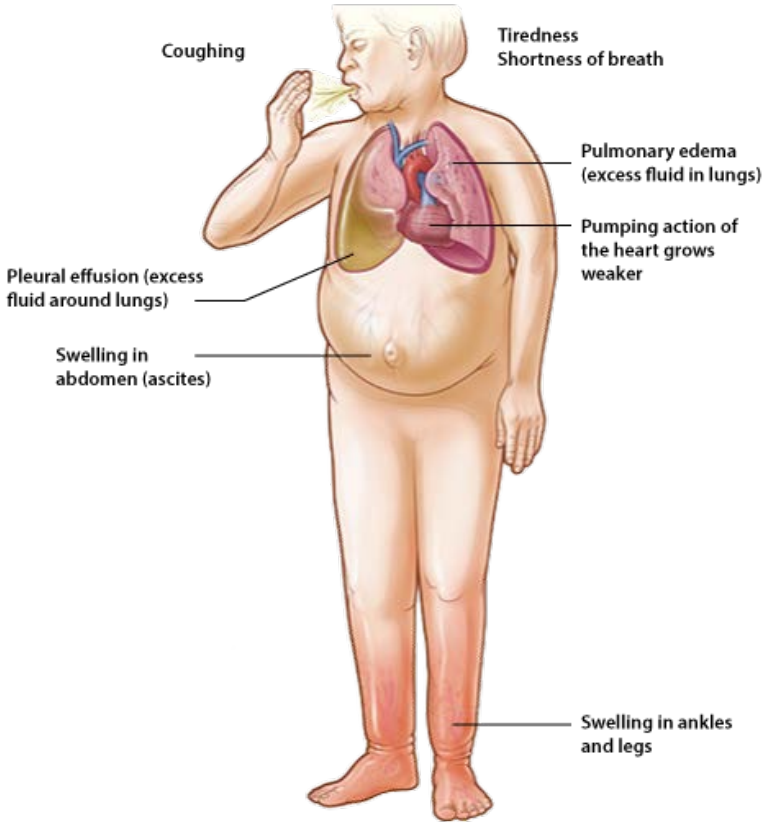
What is Fluid Overload?

- Excess fluid, primarily salt and water, builds up throughout the body resulting in weight gain
- Can result in breathing distress and ER admission
- Causes include:
  - Heart Failure (HF)[1]
  - Nephrotic Syndrome[1]
  - Liver Damage[1]
  - Kidney Damage[1]
  - Pre- and Post-Cardiothoracic Surgery[2,3,4]
  - Treatment for Burns or Trauma[5]

1. Lewis JL, et al. Volume Overload. Merck Manual (Professional Version). Nov 2016. 2. Holte K, et al. Br J of Anaesth. 2002 Oct; 89 (4) 622-32. 3. Morin JF, et al. World Journal of Cardio Surgery, 2011; 1, 18-23. 4. Pradeep A, et al. HSR Proceedings in Intensive Care and Cardiovascular Anesthesia 2010; 2: 287-296. 5. https://www.renalandurologynews.com/nkf-2012-general-news/fluid-overload-in-burn-patients-affects-survival/article/240978/.

Fluid Overload Causes Significant Complications

- Linked to mortality in critically ill patients[1]
- Associated with dangerous complications, such as[1]:
  - Pulmonary Edema
  - Cardiac Failure
  - Delayed Wound Healing
  - Tissue Breakdown
  - Impaired Bowl Function
- May contribute to renal dysfunction, arrhythmias, and infection[2]



1. Granado R, et al. Fluid Overload in the ICU: Evaluation and Manageement. BMC Nephrology (2016) 17:109 2. Stein A, et al. Critical Care. 2012;16:R99.

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Medicare Penalizes Hospitals with Excessive HF Readmissions

In 2012, the Affordable Care Act instituted the Hospital Readmission Reduction Program[1]

- **Requirement**: CMS to reduce payments to hospitals with excess 30-day readmissions
- **Penalty**: hospitals can lose ≤3% of Medicare reimbursement on all admissions
- **Penalty:** No additional DRG payment for patients readmitted to the hospital within 30-days of initial discharge
- **Statistics:** CMS shows 25% of heart failure patients are readmitted to the hospital within 30-days

1. Readmissions Reduction Program (HRRP). Centers for Medicare & Medicaid Services website. Updated April 18, 2016. Accessed May 25, 2016. 2. Journal of the American Medical Association (JAMA), November 2017

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Economic Benefits of Using Aquadex FlexFlow in the Inpatient Heart Failure Setting

- Ultrafiltration has shown significant decreases in heart failure ***rehospitalizations and rehospitalization lengths of stay*** compared to diuretics[1]
- Recent analysis demonstrated a cost savings of ***$3,975 per patient*** when using ultrafiltration versus diuretic therapy over 90 days[2]
- An Aquadex FlexFlow program reduces excess readmissions and reduces Medicare DRG penalties

Ultrafiltration vs. Diuretics for the Treatment of Fluid Overload in Patients with Heart Failure: A Hospital Cost Analysis

Background

Objective

Methods

Figure 1: Decision Analytic Framework*

Results

Figure 2: Hospital Readmission Costs per Patient at 90 Days following Discharge

Figure 3: Tornado Diagram for One-way Sensitivity Analysis

Conclusion

1. Costanzo MR et al. J Am Coll Cardiol. 2007;49(6):675-683. 2. Costanzo MR, et al. Ultrafiltration vs. Diuretics for the Treatment of Fluid Overload in Patients with Heart Failure: A Hospital Cost Analysis. Value Health.

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Diuretics are the Standard of Care, but Fail to Provide Optimal Outcomes in Many Patients

- 40% of patients demonstrate **diuretic resistance** ("failure") and 68% show **sub-optimal response**[1]
- Nearly 50% of HF patients are discharged from the hospital with residual excess fluid:[2]
  - Worsening heart failure with **increased mortality** after discharge
  - Insufficient symptom relief, such as **persistent congestion**
  - Increase in **re-hospitalization** rates
  - Risk of **electrolyte imbalances** (i.e. low magnesium and low potassium)

1. Testani, Circ Heart Failure, 2016;9:e002370 2. Costanzo MR, et al., J Am Coll Cardiol., 2017; 69: 2428-45

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Aquadex FlexFlow System: A Solution to this Unmet Clinical Need

- Safe, effective, and clinically proven to remove excess salt and water from the body
- 40% more fluid removal than conventional diuretic drug therapy over the same period of time[1]
- No clinically significant impact on electrolytes balance, blood pressure, or heart rate[1,2]
- Prescribed by any medical specialty trained in extracorporeal therapy
- 53% reduction in the risk of HF rehospitalization than those treated solely with diuretics at 90 days[3]
- Fewer HF re-hospitalization days due to cardiovascular event[4]

1 Bart BA, et. al., *Am Coll Cardiol*., 2005;46:2043– 6. 2 Jaski BE et al. J Card Fail. 2003; 9(3):227-231. 3 Costanzo MR, et al. *J Am Coll Cardiol*. 2007 Feb 13; 49(6): 675-683. 4. Costanzo MR, et. al., *J Am Coll Cardiol*., 2005;46:2047–51.

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Aquadex FlexFlow Product Overview

Aquadex FlexFlow Console

Blood Circuit Set

Dual Lumen venous catheter

Clinical Results Demonstrate the Potential of Aquadex FlexFlow

Good Samaritan Hospital-A Single Center Experience

Independent study of 67 heart failure patients who received Aquadex FlexFlow therapy:

- No 30-day readmits for volume overload
- Length of stay when started within 24 hours was 2.2 days, compared to national average of 5.9 days
- Readmission rate from before aquapheresis down from 12% to 4% the year prior
- Average of 5.7 liters removed per patient

Data presented at the National Teaching Institute & Critical Care Exposition (NTI) in Chicago, IL on May 5-8, 2008. Results may vary.

The Aquadex Flexflow System Has Been Studied In More HF Patients Than All Other Ultrafiltration Systems Combined

Study Name	Study Design	# of Patients	Rationale	Publication Date
SAFE	Multi-center, prospective, single-arm	21	IDE for 510k	2003 JCF
EUPHORIA	Single-center, prospective, single-arm	20	Early Ultrafiltration (UF) in diuretic resistance	2005 JACC
RAPID-HF[1]	Multi-center, prospective, RCT	40 20 UF/20 SC	Early UF vs Diuretics	2005 JACC
UNLOAD[1]	Multi-center, prospective, RCT	200 100 UF/100 SC	UF vs SC	2007 JACC
CARRESS-HF[1]	Multi-center, prospective, RCT	188 94 UF/94 SC	UF vs SC patients with cardiorenal syndrome	2012 NEJM
AVOID-HF[1]	Multi-center, prospective, RCT	224 110 UF/114 SC (810 planned)	UF vs SC to evaluate readmissions	2016 JACC:HF

Highest Level of Evidence: Level 1 (Randomized Clinical Trial)[1]

1. Level of Evidence Grading Scale as Adapted from the Oxford Centre for Evidence-based Medicine (2009)

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Clinical Guidelines Support Use of Ultrafiltration

ACC/AHA – American College of Cardiology/ American Heart Association[1]

Ultrafiltration may be considered for patients with obvious volume overload to alleviate congestive symptoms and fluid weight, or with refractory congestion not responding to medical therapy

HFSA - Heart Failure Society Of America[2]

Ultrafiltration may be considered in lieu of diuretics

ESC / HFA - European Society of Cardiology and Heart Failure Association[3]

Venovenous isolated ultrafiltration is sometimes used to remove fluid in patients with HF, although is usually reserved for those unresponsive or resistant to diuretics

CCS - Canadian Cardiovascular Society[4]

Patients with persistent congestion despite diuretic therapy, with or without impaired renal function, may, under experienced supervision, receive continuous venovenous ultrafiltration

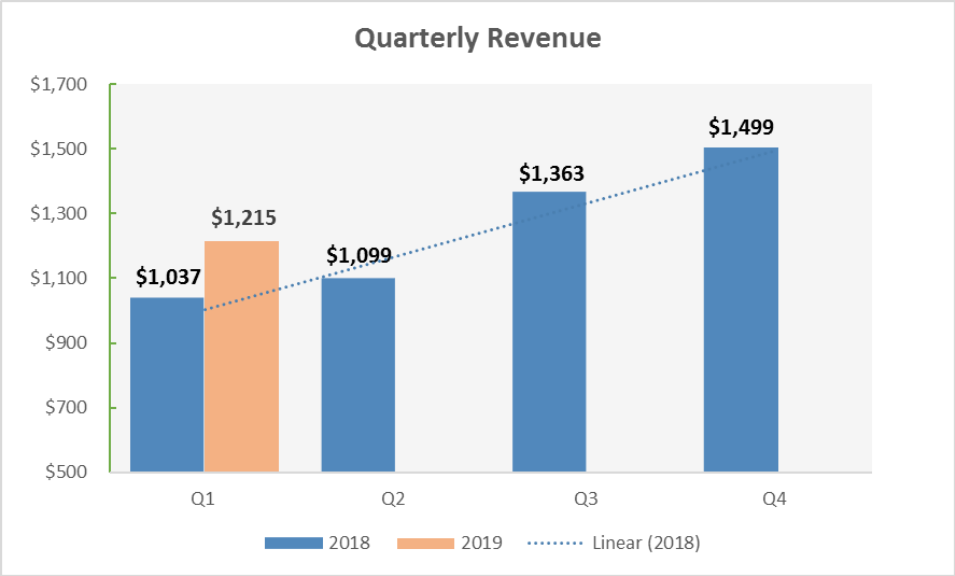
1 Yancy CW, et al. *J Am Coll Cardiol.* 2013 Oct 15; 62(16): e147-e239.
2 HFSA 2010 Comprehensive Heart Failure Practice Guidelines: Lindenfeld J, et al. J Card Fail. 2010 Jun; 16(6): 475 – 539.
3 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: McMurray JJ, et al. Eur Heart J. 2012 Jul; 33(14): 1787 – 1847.
4 2012 Canadian Cardiovascular Society Heart Failure Management Guidelines Update: McKelvie RS, et al. Can J Cardiol. 2013 Feb; 29(2): 168 – 181.

Expanding Commercial Distribution

- US direct sales team growing to 15 sales territories and 15 clinical education specialists
- Distribution partners in UK, Italy, Germany, Spain, Singapore, Hong Kong, Thailand, India and Brazil
- FDA 510(k) market cleared in US; sold internationally with local regulatory approval
- Manufacturing all products in our Minneapolis, MN facility

Financial Metrics

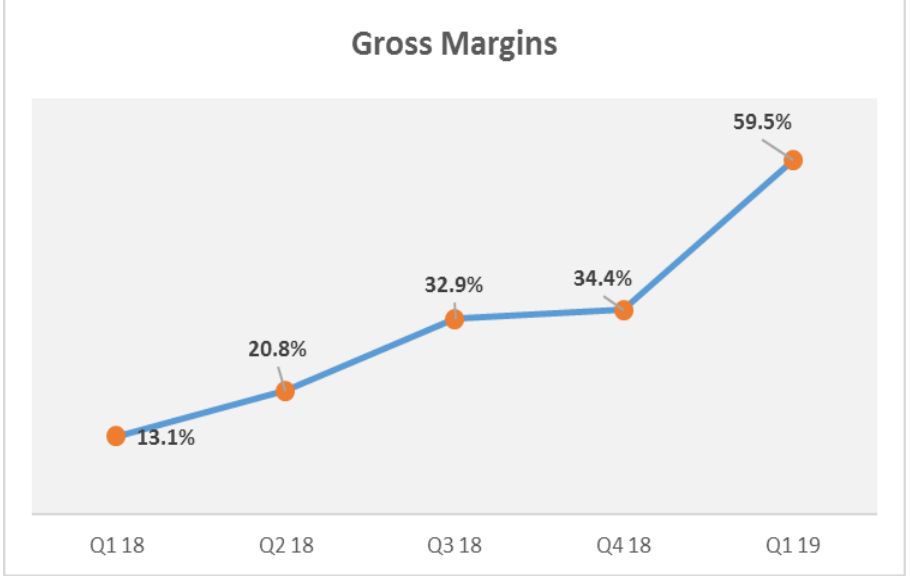
Quarterly Revenue, YoY Growth



YoY Growth Rates					
2018	15%	27%	42%	80%	
2019	**17%**				

We have delivered double-digit year-over-year quarterly growth for the last 8 quarters

Gross Margins



We began selling our internally manufactured inventory in Q1 2019, driving substantial improvements in our gross margins

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Capitalization Table

Capitalization as of March 31, 2019	
Common Shares Outstanding (Nasdaq CHFS)	**2,069,020**
Series F Convertible Preferred (1)	102,185
Series G Convertible Preferred (2)	810,142
Series G Warrants (exercise price $5.25) (3)	4,731,428
Warrants (3) (weighted average exercise price $50.23)	599,293
Options (weighted average exercise price $61.25)	138,104
Fully Diluted Shares	**8,450,172**

(*) Financing completed March 13, 2019 for $12.4M gross proceeds. Cash of $11.5M as March 31, 2019; no outstanding debt.

(1) Convertible at $5.25 per share, anti-dilution rights to next offering price
(2) Convertible at $5.25 per share. No anti-dilution rights
(3) Consists of Series 1, which expire on March 2024, and Series 2, which expire earlier of: FDA approval for Pediatrics, or Sept 2020. No anti-dilution rights
(4) Consists of 554,322 warrants exercisable at $29.68, expiring Nov 2019 and Nov 2024; 9,494 warrants exercisable at $63.0, expiring Nov 2024; and 35,477 warrants exercisable at a weighted average exercise price of $367.89, expiring Feb 2022-Feb 2025. No anti-dilution rights.

CHF Solutions Investment Considerations

- **Rapidly growing, revenue generating, medical device company**
- **Expanding commercial focus beyond initial market**:
  - **Heart Failure**: our largest market opportunity, pursing diagnostic opportunities to expand adoption. Increasing focus in outpatient hospital clinics and leveraging Tampa VA outpatient clinical study
  - **Cardiac Surgery:** leveraging acute need and clinical and economic benefits to drive adoption
  - **Pediatrics:** providing a solution to an underserved market and seeking label modification
- **US commercial footprint and growing international distributor network**
  - U.S-based direct sales force and clinical education support specialists
  - Growing international distribution network
- **Anticipated milestones**
  - Tampa VA first patient enrollment in outpatient study – Q3 2019
  - Pediatric label expansion: 2H 2019
  - Therapy initiation in several hospital systems for CV Surgery and Heart Failure

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Thank you