



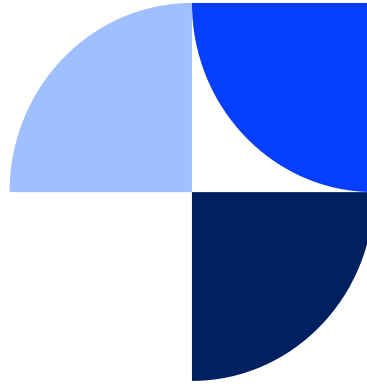
Global Leader in Allogeneic Cellular Medicines for Inflammatory Diseases

Operational Highlights & Financial Results for the
Quarter Ended September 30, 2022

and

Annual General Meeting 2022

November 2022

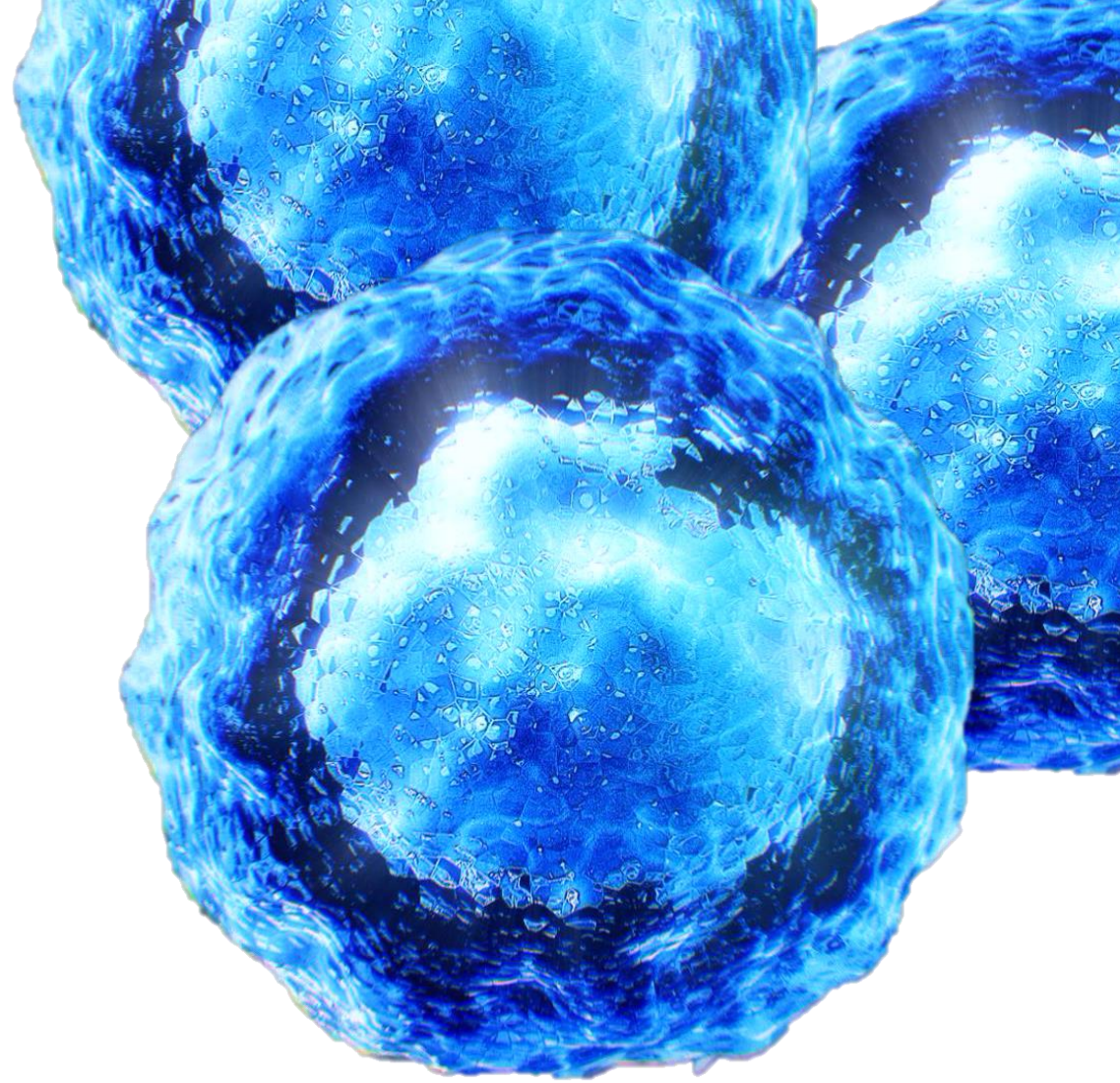


CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This presentation includes forward-looking statements that relate to future events or our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to differ materially from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. We make such forward-looking statements pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and other federal securities laws. All statements other than statements of historical facts contained in this presentation are forward-looking statements. Words such as, but not limited to, “believe,” “expect,” “anticipate,” “estimate,” “intend,” “plan,” “targets,” “likely,” “will,” “would,” “could,” and similar expressions or phrases identify forward-looking statements. We have based these forward-looking statements largely on our current expectations and future events, recent changes in regulatory laws, and financial trends that we believe may affect our financial condition, results of operation, business strategy and financial needs. These statements may relate to, but are not limited to: expectations regarding the safety or efficacy of, or potential applications for, Mesoblast’s adult stem cell technologies; expectations regarding the strength of Mesoblast’s intellectual property, the timeline for Mesoblast’s regulatory approval process, and the scalability and efficiency of manufacturing processes; expectations about Mesoblast’s ability to grow its business and statements regarding its relationships with current and potential future business partners and future benefits of those relationships; statements concerning Mesoblast’s share price or potential market capitalization; and statements concerning Mesoblast’s capital requirements and ability to raise future capital, among others. Forward-looking statements should not be read as a guarantee of future performance or results, and actual results may differ from the results anticipated in these forward-looking statements, and the differences may be material and adverse. You should read this presentation together with our financial statements and the notes related thereto, as well as the risk factors, in our most recently filed reports with the SEC or on our website. Uncertainties and risks that may cause Mesoblast’s actual results, performance or achievements to be materially different from those which may be expressed or implied by such statements, include, without limitation: risks inherent in the development and commercialization of potential products; uncertainty of clinical trial results or regulatory approvals or clearances; government regulation; the need for future capital; dependence upon collaborators; and protection of our intellectual property rights, among others. Accordingly, you should not place undue reliance on these forward-looking statements. We do not undertake any obligations to publicly update or revise any forward-looking statements, whether as a result of new information, future developments or otherwise.

Our Mission

Mesoblast is committed to bringing to market innovative cellular medicines to treat serious and life-threatening illnesses



Remestemcel-L: BLA Response to FDA CRL for Steroid-Refractory Graft Versus Host Disease

- Survival outcomes have not improved over the past two decades for children or adults with the most severe forms of SR-aGVHD. The lack of any approved treatments for children under 12 means that there is an urgent need for a therapy that improves the dismal survival outcomes in children
- In light of the unmet need, remestemcel-L has been granted Fast Track Designation and BLA Priority Review from the FDA
- A major milestone in the Company's complete response to the FDA was the submission at the end of the last quarter of substantial new information on clinical and potency assay items to the Investigational New Drug (IND) file for remestemcel-L in the treatment of children with SR-aGVHD, as guided by FDA
- Mesoblast has optimized a potency assay that was in place at the time of the Phase 3 trial and which demonstrates a relationship between the product's activity in vitro and its effects on survival in the Phase 3 trial
- Additionally, Mesoblast has now generated data from the expanded access program (EAP 275) of 241 children which confirm the ability of the in-vitro potency assay to measure product activity relevant to survival outcomes

Remestemcel-L: Long-Term Survival Data a Cornerstone of BLA Resubmission to FDA for SR-aGVHD

- ▶ Today Mesoblast provided new results from a four-year observational survival study performed by the Center for International Blood and Marrow Transplant Research (CIBMTR) on 51 evaluable patients with SR-aGVHD who were enrolled in Mesoblast's phase 3 clinical trial of remestemcel-L.
- ▶ Overall survival in the remestemcel-L cohort was 63% at 1 year, 51% at 2 years, and 49% at 4 years
- ▶ Across four recently published studies of children or adults with SR-aGVHD, 1 year survival of 40-49% and 2 year survival of 25%-38% were seen¹⁻⁴ after best available therapy (BAT) or the only FDA-approved agent for adults, ruxolitinib
- ▶ The new long-term survival data provide assurance that the short-term day 28 responses and early survival through 180 days in the 54-patient Phase 3 trial in children with SR-aGVHD previously presented to FDA in the original BLA submission are unlikely to have arisen by chance
- ▶ These long-term survival outcomes are a cornerstone of the BLA resubmission

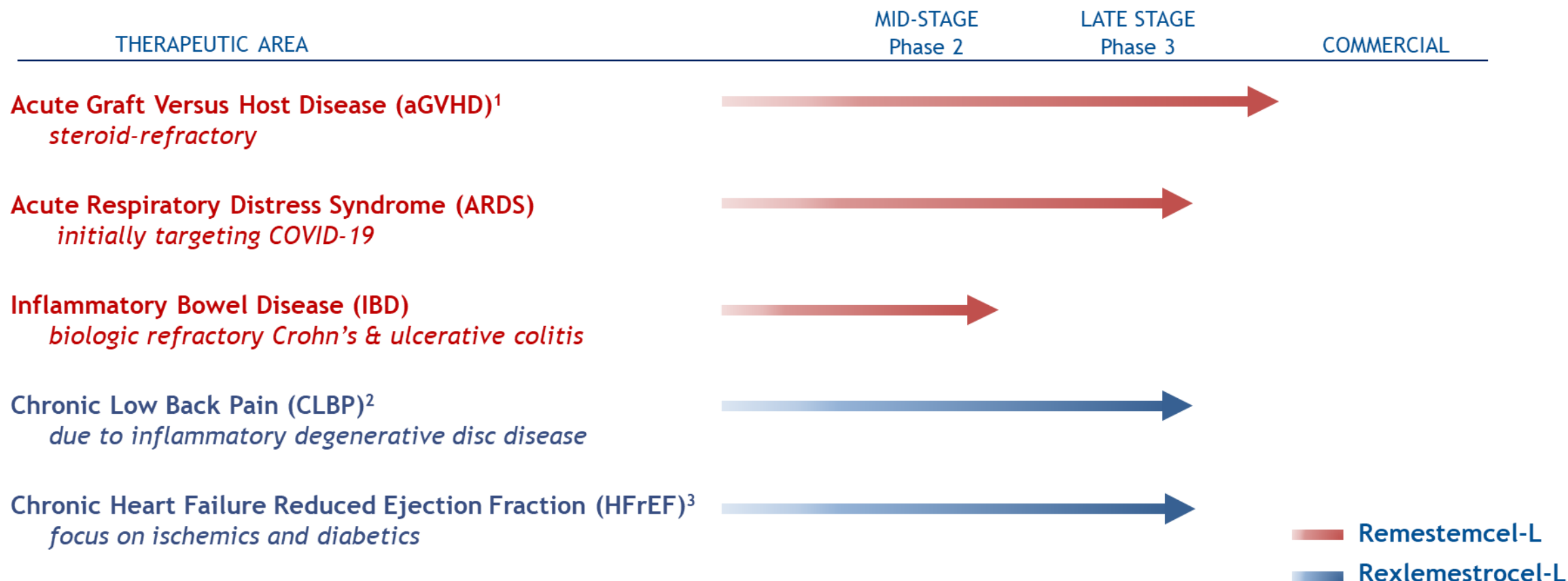
1. MacMillan ML et al. Pediatric acute GVHD: clinical phenotype and response to upfront steroids. Bone Marrow Transplant 2020; 55(1): 165-171

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3. Zeiser R et al. Ruxolitinib for Glucocorticoid-Refractory Acute Graft-versus-Host Disease. N Engl J Med 2020;382:1800-10.

4. Jagasia M et al. Ruxolitinib for the treatment of steroid-refractory acute GVHD (REACH1): a multicenter, open-label phase 2 trial. Blood. 2020 May 14; 135(20): 1739-1749.

Late-Stage Clinical Pipeline



This chart is figurative and does not purport to show individual trial progress within a clinical program

1. JCR Pharmaceuticals Co., Ltd. (JCR), has the right to develop mesenchymal stromal cells (MSCs) in certain fields for the Japanese market, including for the treatment of hematological malignancies, such as Graft vs Host Disease, and for hypoxic ischemic encephalopathy (HIE). Mesoblast has the right to use safety and efficacy data generated by JCR to support its development and commercialization plans for remestemcel-L in the US and other major healthcare markets, including for GVHD and HIE
2. Grünenthal has exclusive commercial rights to rexlemestrocel-L for chronic low back pain in Europe and Latin America/Caribbean
3. Tasly Pharmaceuticals has exclusive commercial rights to rexlemestrocel-L for the treatment or prevention of chronic heart failure in China



Financial Results

for the Period Ended September 30, 2022

Manufacturing Remestemcel-L

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Financial Highlights

- ❑ At September 30, 2022, cash-on-hand was US\$85.5 million.
- ❑ Up to an additional US\$40.0 million may be drawn from existing financing facilities subject to achieving certain milestones, with current discussions to extend the period for the drawdown option.
- ❑ Net cash usage for operating activities in the quarter was US\$14.3 million; this represented a 22% reduction (US\$3.9 million) on the comparative quarter in FY2022, and a 47% reduction (US\$12.5 million) on the comparative quarter in FY2021.
- ❑ Revenue from royalties on sales of TEMCELL® HS Inj.¹ sold in Japan by our licensee for the quarter were US\$1.4 million and US\$1.8 million on a constant currency basis. For the 12-month period ended September 30, 2022 royalties were US\$7.7 million, and on a constant currency basis² US\$9.0 million, a 9% increase on the comparative period.

1. TEMCELL® HS Inj. is a registered trademark of JCR Pharmaceuticals Co. Ltd.

2. TEMCELL sales by our Licensee are recorded in Japanese Yen before being translated into USD for the purposes of calculating the royalty paid to Mesoblast. Results have been adjusted for the movement of the USD to Japanese Yen exchange rate from 1USD:110.2Yen for the 12 months ended September 30, 2021 to 1USD:129.2Yen for the 12 months ended September 30, 2022.

Reduction in Expenditure on R&D and Manufacturing, Improved Loss Before Tax

P&L for the 3 months ended (US\$m)	Sep 30, 2022	Sep 30, 2021
Total Revenue	1.5	3.6
Research and development	(5.7)	(9.3)
Manufacturing	(4.9)	(7.5)
Management & administration	(6.9)	(5.9)
Revaluation of contingent consideration	4.5	0.3
Revaluation of warrant liability	(0.4)	-
Other operating income & expenses	(0.5)	(0.2)
Finance costs	(4.5)	(3.7)
Loss before tax	(16.9)	(22.7)
Income tax benefit	0.1	0.1
Loss after tax	(16.9)	(22.6)

□ Revenue

Majority of change due to one-off licensing milestone in prior period and impact of currency movement

□ Reduction in Expenditure:

Expenditure for R&D, Manufacturing and Management & Administration inclusive of non-cash items, were US\$17.5 million, a decrease of 23% (US\$5.2 million) for the quarter ended September 30, 2022 on the comparative quarter.

□ Continued Investment in Manufacturing:

During the quarter we continued pre-launch manufacturing activities and product testing for remestemcel-L to support the potential commercial launch for SR-aGVHD.

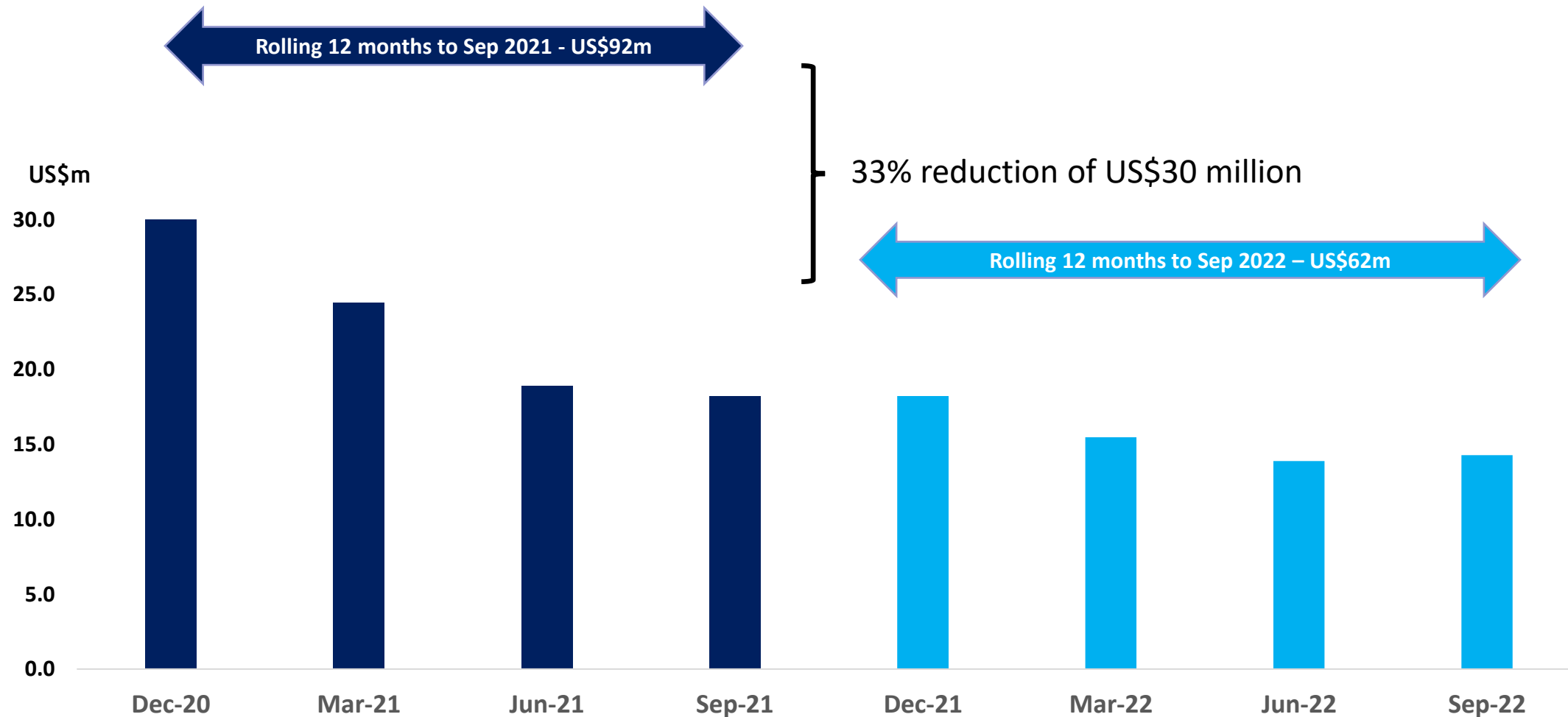
On FDA approval, remestemcel-L inventory will be recognized on the balance sheet, currently at US\$28.0 million.

□ Finance Costs included actual cash interest paid of US\$1.2 million for the quarter ended September 30, 2021 and 2022.

The increase in reported Finance Costs was primarily due to the recognition of a non-cash gain on revaluation of our borrowings in the comparative year due to a reduction in expected value of future repayments.

Figures have been rounded.

Quarterly Net Operating Cash Burn has been significantly reduced



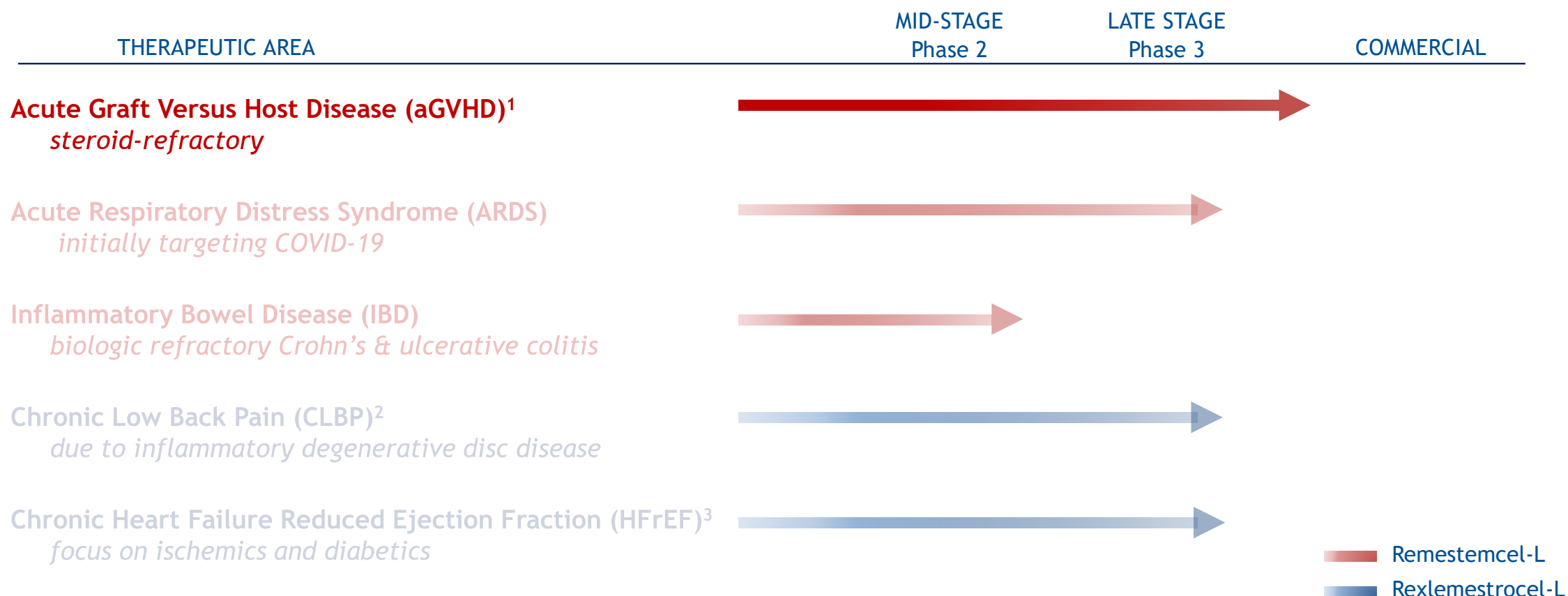
- Quarterly net operating cash burn trending down.

Clinical Pipeline

Current Status and Anticipated Milestones



Late-Stage Clinical Pipeline



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Remestemcel-L: Steroid-Refractory Acute Graft Versus Host Disease

Significant Unmet Need with High Mortality

Treatment Options

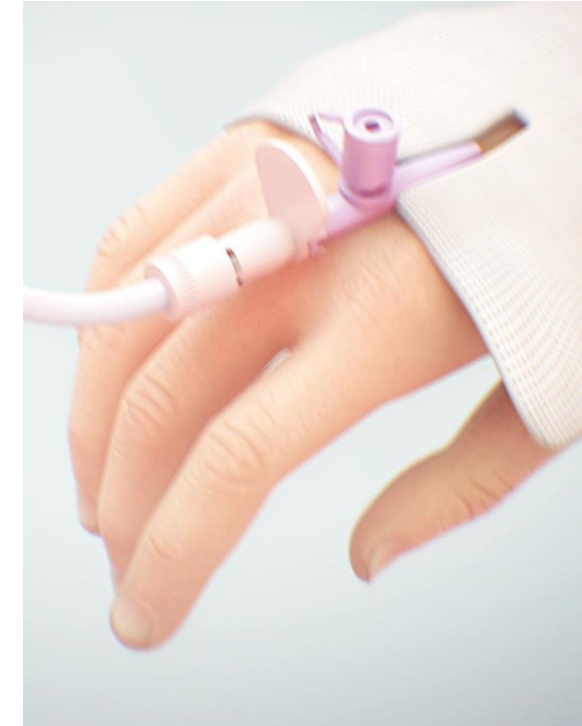
- Corticosteroids are first-line therapy for aGVHD
- There is only one approved treatment for disease refractory to steroids and no approved treatment in the US for children under 12 years old
- In Japan, Mesoblast's licensee has received the only product approval for SR-aGVHD in both children and adults

Burden of Illness

- Acute GVHD is a life-threatening complication that occurs in ~50% of patients receiving allogeneic bone marrow transplants (BMTs)¹
- Acute GVHD primarily affects skin, GI tract, and liver
- Steroid-refractory aGVHD is associated with mortality rates as high as 90%^{1,5} and significant extended hospital stay costs²

Market Opportunity

- More than 30,000 allogeneic BMTs performed globally (>20K US/EU) annually, ~20% pediatric^{3,4}
- Approx. 1,500 allogeneic BMTs in children and adolescents in US⁴



Steroid-refractory aGVHD is associated with mortality rates as high as 90%

1. Westin, J., Saliba, RM., Lima, M. (2011) Steroid-refractory acute GVHD: predictors and outcomes. *Advances in Hematology*. 2. Anthem-HealthCore/Mesoblast claims analysis (2016). Data on file 3. Niederwieser D, Baldomero H, Szer J. (2016) Hematopoietic stem cell transplantation activity worldwide in 2012 and a SWOT analysis of the Worldwide Network for Blood and Marrow Transplantation Group including the global survey. 4. HRSA Transplant Activity Report, CIBMTR, 2019 5. Axt L, Naumann A, Toennies J (2019) Retrospective single center analysis of outcome, risk factors and therapy in steroid refractory graft-versus-host disease after allogeneic hematopoietic cell transplantation. *Bone Marrow Transplantation*.

Remestemcel-L Improved Early Survival in Children with SR-aGVHD

Remestemcel-L improved early survival in three controlled studies:

1. First-line therapy after steroids

- 27 children in a randomized controlled Phase 3 trial of 260 patients with SR-aGVHD
- 54 children in open-label Phase 3, 89% with Grade C/D disease, compared with 30 propensity controlled children in MAGIC cohort¹⁻³

2. Salvage therapy in 241 children after failure of steroids and other biologic agents

- 51 children in open-label arm with Grade D disease, compared with 327 propensity-controlled children in CIBMTR database

Day 100 Survival	Remestemcel-L	Matched Controls
Protocol 280 (pediatric), Grade B-D	79% (n=14)	54% (n=13)
Phase 3 (Study 001), Grade B-D	74% (n=54) ¹	57% ² (n=30) ³
Expanded Access Protocol 275	66% (n=241)	na
Expanded Access Protocol 275, Grade D	51% (n=51)	31% (n=327) ⁴

1. GVHD001 had 55 randomized patients, however one patient dropped out before receiving any dose of remestemcel-L; 2. Mount Sinai Acute GVHD International Consortium (MAGIC) - a group of ten BMT centers throughout the US and Europe whose purpose is to conduct ground-breaking clinical trials in GVHD, including developing informative biorepositories that assist in developing treatments that can guide GVHD therapy; 3. Two subjects in the MAGIC cohort had follow-up <100 days; these subjects are excluded from the respective survival analyses; 4. Data on file

Remestemcel-L Long-Term Survival in Children with SR-aGVHD

Data received from CIBMTR from Phase 3 study of remestemcel-L in 54 children, 89% with Grade C/D disease.

Overall survival through 4 years follow-up in 51 children:

- 1-year 63%; 2-year 51%; 3-year 49%; 4-year 49%

SR-aGVHD Overall Survival	Remestemcel-L Mesoblast GVHD001 51 children 88% Grade C/D	BAT MacMillan et al ¹ 128 children 22% Grade III/IV	BAT Rashidi et al ² 203 adults 54% Grade III/IV	BAT Zeiser et al ³ 155 adults 63% Grade III/IV	Ruxolitinib REACH2 Zeiser et al ³ 154 adults 63% Grade III/IV	Ruxolitinib REACH1 Jagasia et al ⁴ 71 adults 68% Grade III/IV
1 year	63%	40%	-	44%	49%	43%
2 year	51%	35%	25%	36%	38%	-

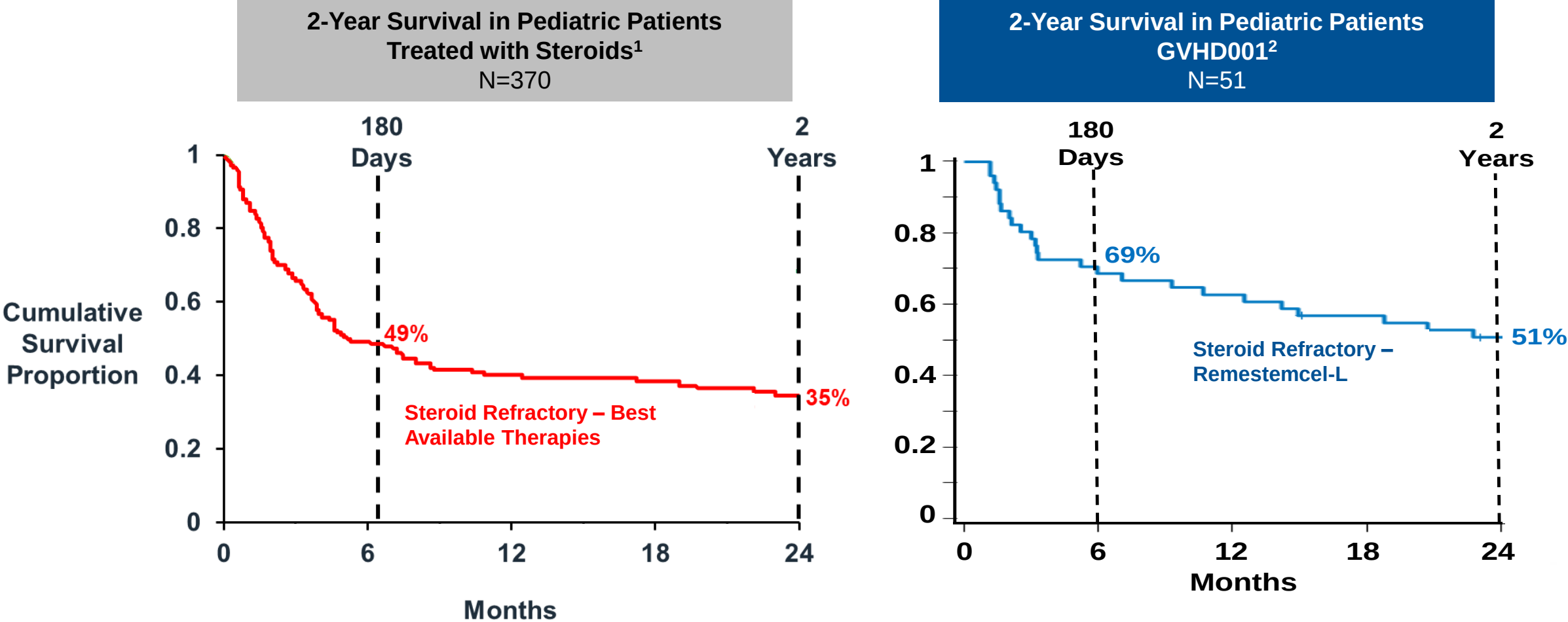
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Remestemcel-L has the Potential to Improve Bleak Long-Term Survival (>2 Years) in Pediatric SR-aGVHD

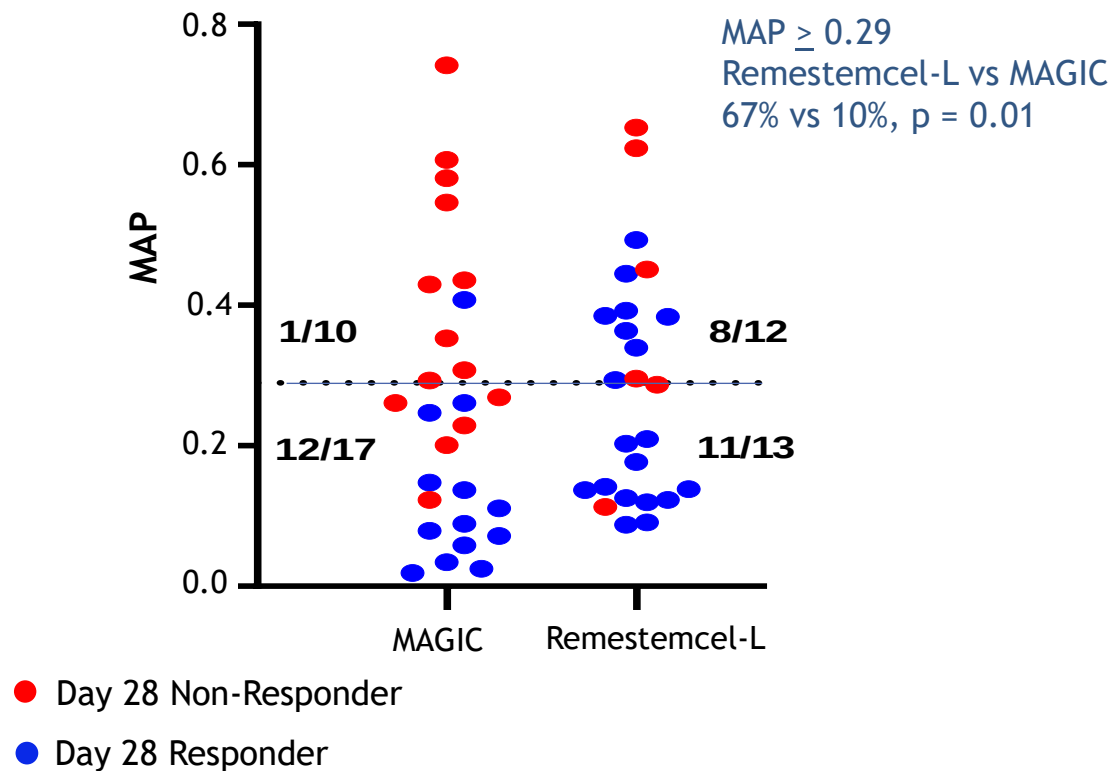


1. Adapted and redrawn from Figure 2 of MacMillan, M.L. et al. Pediatric acute GVHD: clinical phenotype and response to upfront steroids. Bone Marrow Transplant 55, 165-171 (2020);
2. CIBMTR - Center for International Blood & Bone Marrow Transplantation Research. Clinical Outcomes of Pediatric Patients Treated with Remestemcel-L for Steroid-Refractory Acute Graft-Versus-Host Disease on a Phase 3, Single-Arm, Prospective Study (Nov 2022)

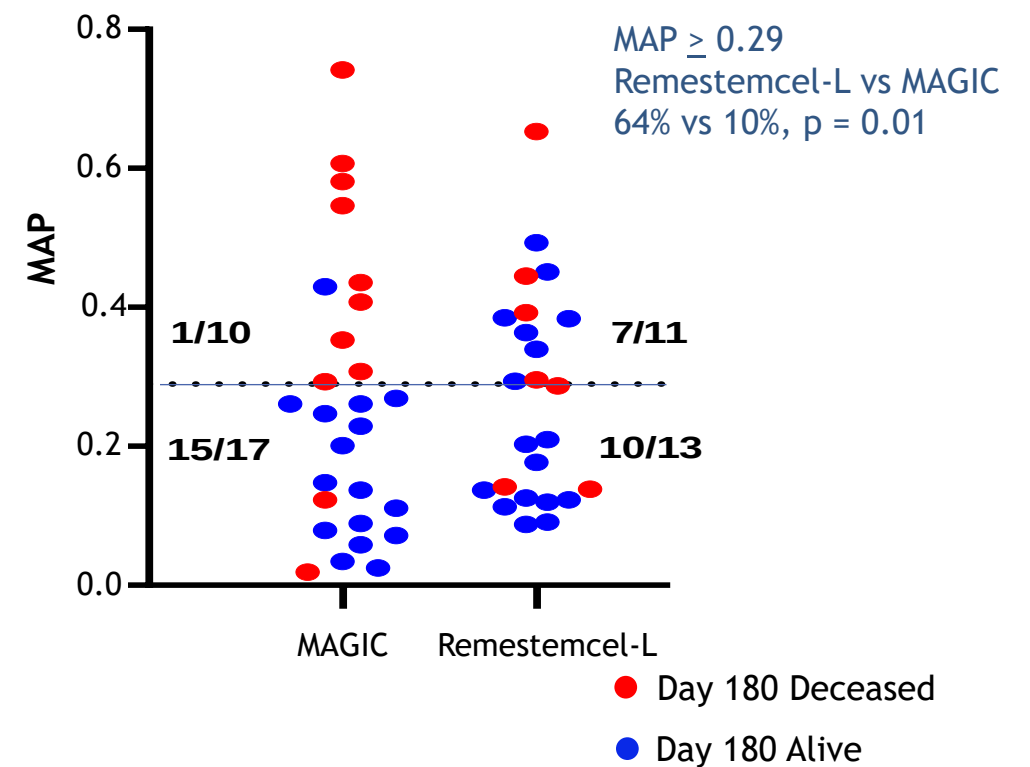
Remestemcel-L for Steroid-Refractory Graft Versus Host Disease in Highest-Risk Patients

Significantly Greater Day 28 Overall Responses and Day 180 Survival in Highest-Risk Patients (Baseline MAP ≥ 0.29)

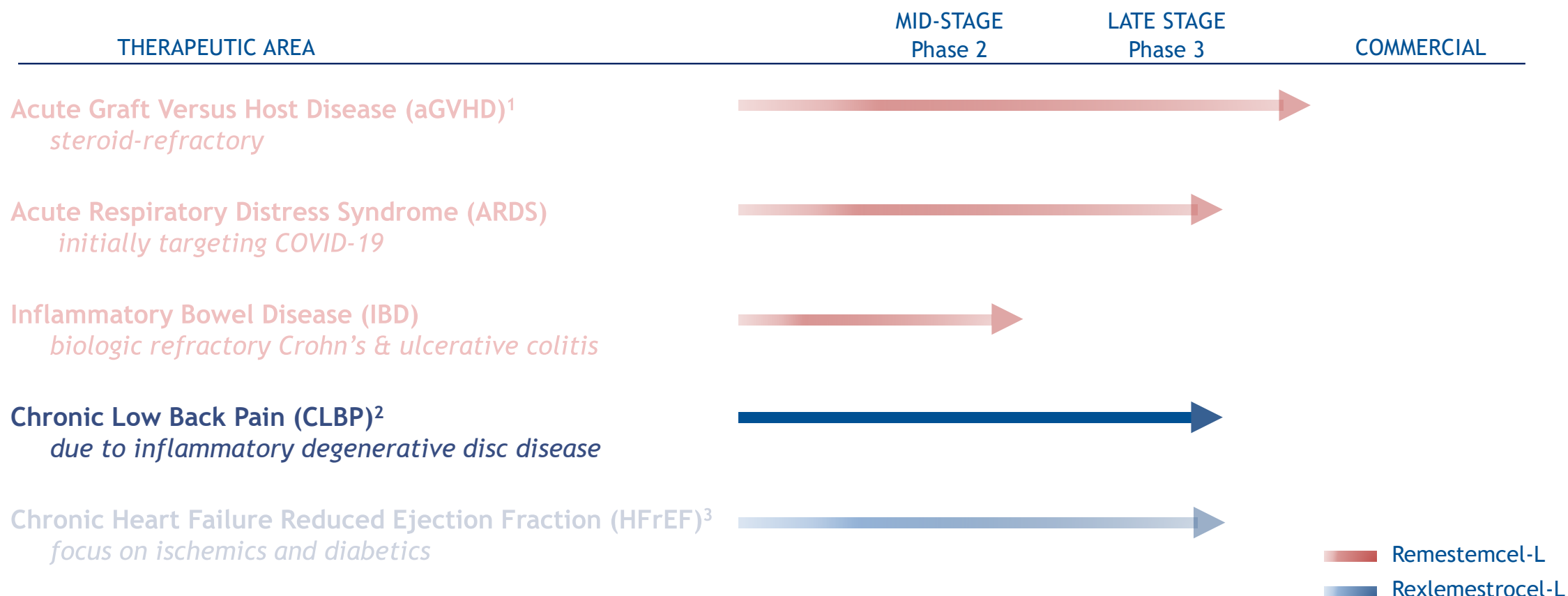
Response by Baseline MAP



Survival by Baseline MAP



Late-Stage Clinical Pipeline



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Rexlemestrocel-L - Opportunity in Chronic Low Back Pain

A New Paradigm for Treatment of Chronic Low Back Pain due to Degenerative Disc Disease

Burden of Illness

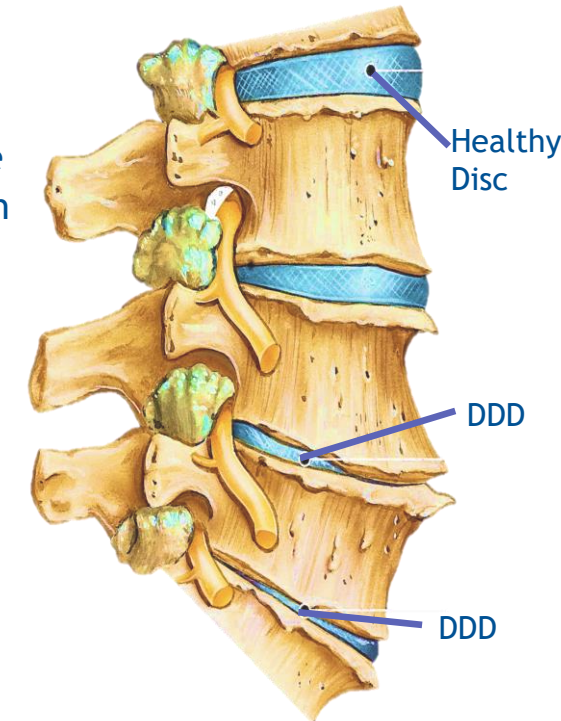
- Back pain causes more disability than any other condition¹
- Inflicts substantial direct and indirect costs on the healthcare system,¹ including excessive use of opioids in this patient population

Treatment Options

- Minimal treatment options for patients with chronic low back pain (CLBP) who fail conservative therapy include opioids and surgery
- 50% of opioid prescriptions are for CLBP³
- Durable improvement in pain has potential to reduce opioid use and prevent surgical intervention

Market Opportunity

- Over 7m patients are estimated to suffer from CLBP due to degenerative disc disease (DDD) in each of the U.S. and E.U.^{3,4,5}

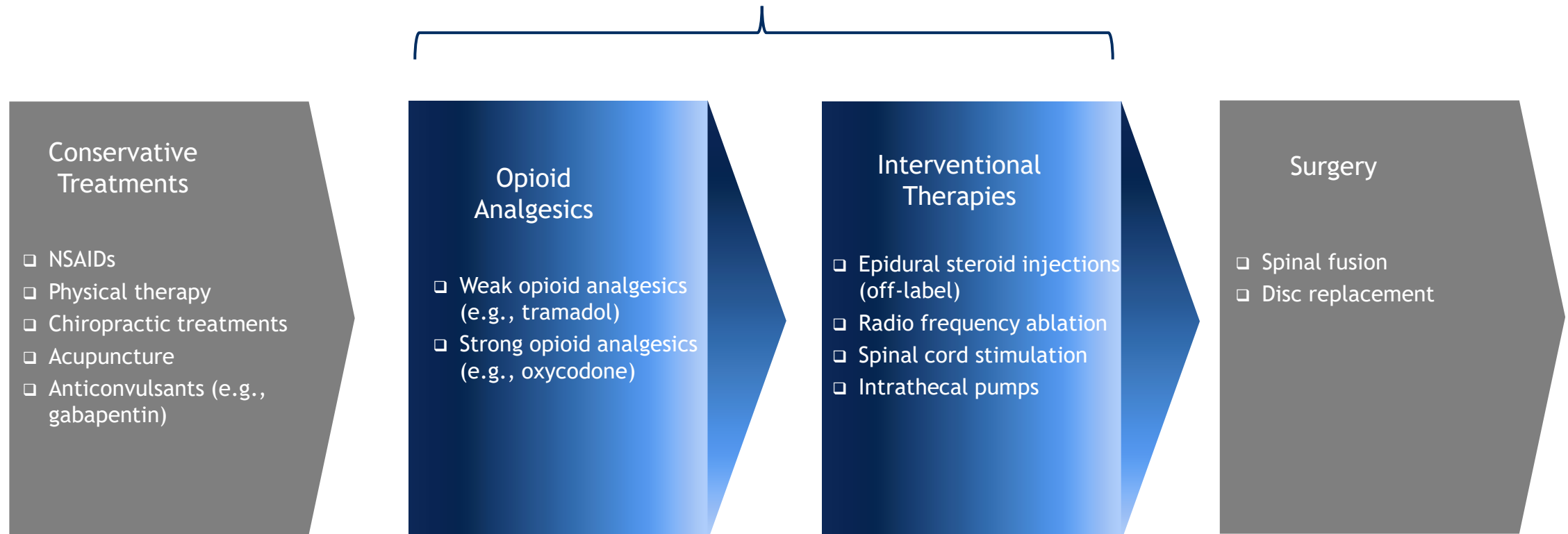


1. Williams, J., NG, Nawi, Pelzter, K. (2015) Risk factors and disability associated with low back pain in older adults in low-and middle-income countries. Results from the WHO Study on global ageing and adult health (SAGE). PloS One. 2015; 10(6): e0127880., 2. Simon, J., McAuliffe, M., Shamim, F. (2015) Discogenic Low Back Pain. Phys Med Rehabil Clin N Am 25 (2014) 305-317., 3. Decision Resources: Chronic Pain December 2015., 4. LEK & NCI opinion leader interviews, and secondary analysis., 5. Navigant: Commercial Assessment for a Proprietary Cell-Based Therapy for DDD in the U.S. and the EU3 - August 2014., 6. HealthCare Utilization and Cost of Discogenic Lower Back Pain in the US - Anthem/HealthCore.

The Patient Treatment Journey

Rexlemestrocel-L Potential for First-Line CLBP associated with DDD, Refractory to Conservative Treatment

Rexlemestrocel-L targeting moderate-to-severe
DCLBP

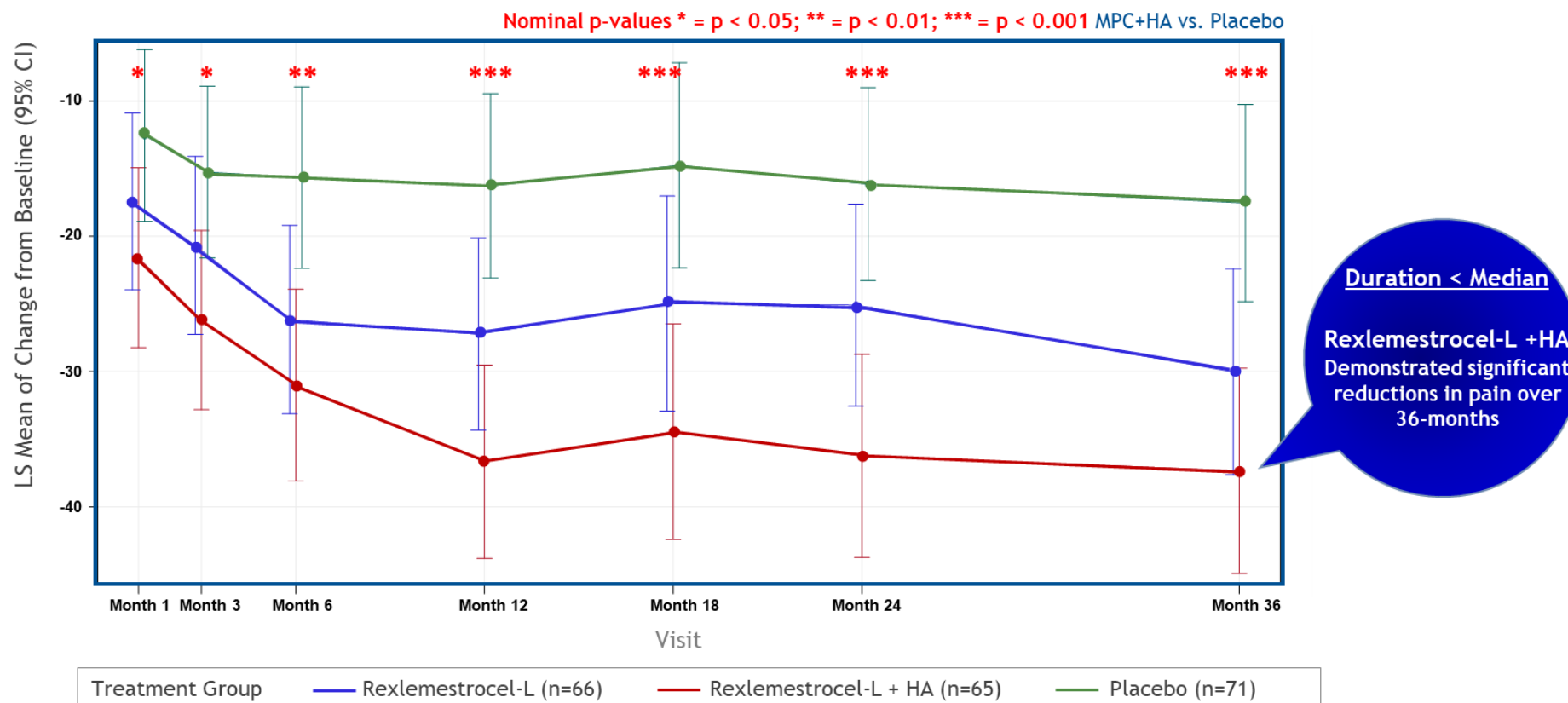


Phase 3 Trial Outcomes - Rexlemestrocel-L for Chronic Low Back Pain

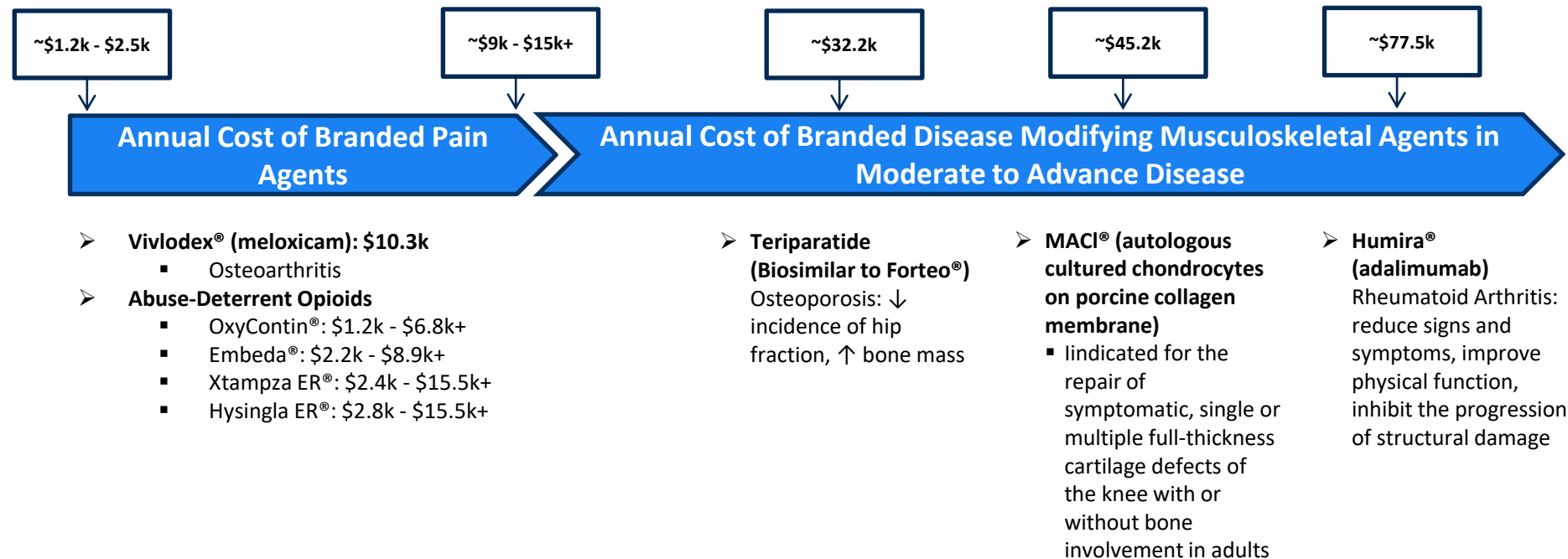
Single Injection of Rexlemestrocel-L + HA Results in >Three Years of Pain Reduction

Greatest pain reduction was observed in the pre-specified population of subjects with CLBP duration shorter than the baseline study median of 68 months (n=202) with significantly greater reduction (nominal p-value < 0.05) at all time points analyzed over 36 months compared with saline controls

LS Mean VAS Change in Low Back Pain from Baseline - Duration CLBP < 68 Month Median Baseline Duration (n=202)



Market Access & Pricing Insights: Pricing will be Driven by Overall Value Offering; US Reference Pricing Suggests Higher Price Points for Disease Modifying Agents

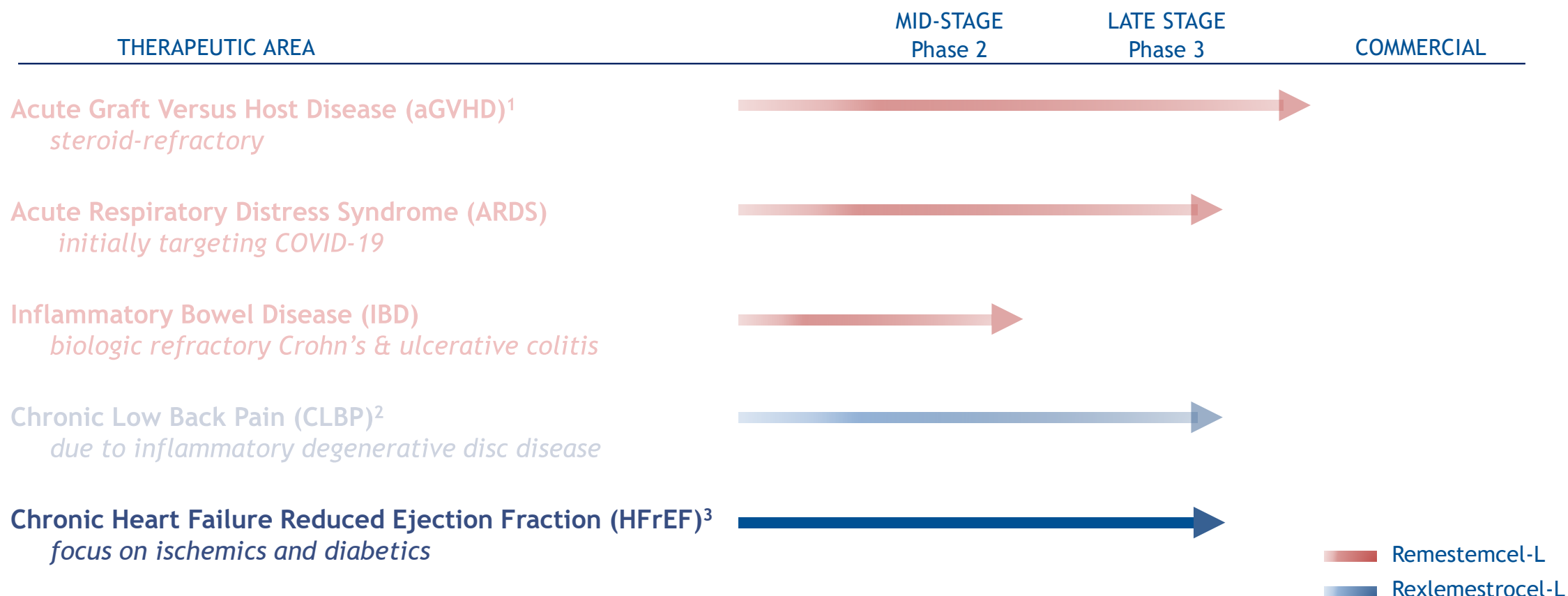


*Wholesale Acquisition Cost (WAC): Redbook 03/30/2021

Rexlemestrocel-L - Phase 3 Trial in Chronic Low Back Pain

- FDA Office of Tissues and Advanced Therapies (OTAT) agreed with Mesoblast's proposal for mean pain reduction at 12 months to serve as the primary endpoint of the second Phase 3 trial and as an approvable indication for the product
- Mean functional improvement and reduction in opioid use as secondary endpoints
- The planned upcoming US trial will include at least 20% of subjects from the EU to support submissions to both FDA and EMA
- Active discussions ongoing with key investigators and advisors on final protocol design

Late-Stage Clinical Pipeline



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Rexlemestrocel-L - Chronic Heart Failure

Rising Incidence & High Mortality

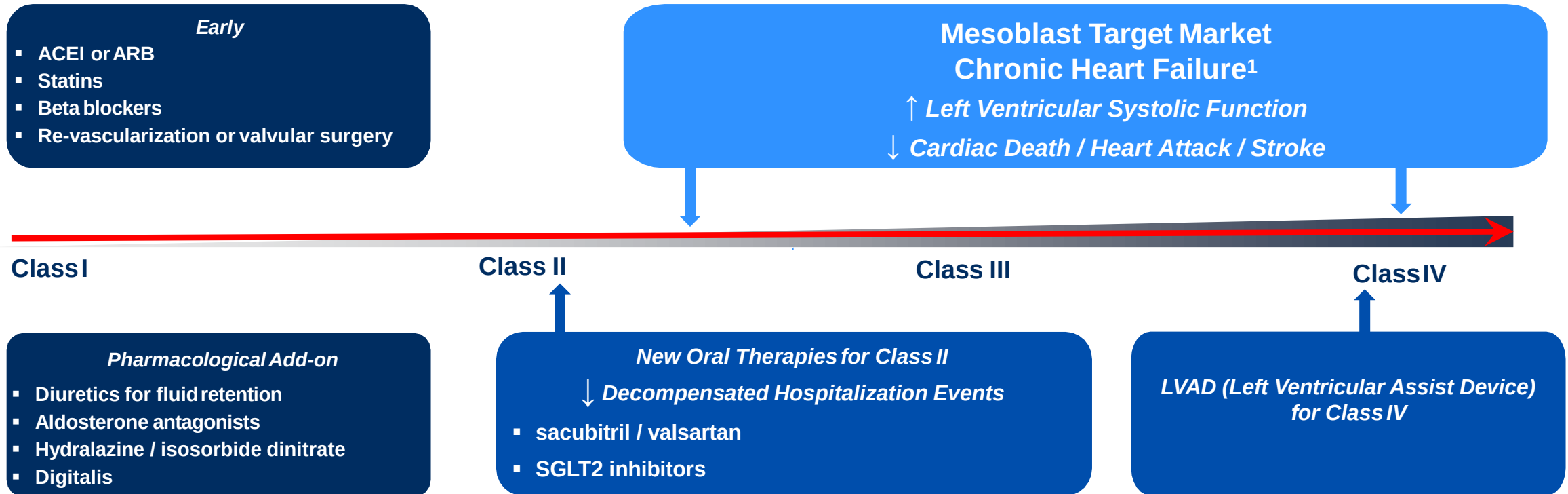
- ❑ Cardiovascular disease (CVD) remains the leading cause of death in the United States¹
- ❑ Heart failure affects 6.5 million patients in the US and 26 million patients globally. As populations age, the prevalence is increasing²
- ❑ Chronic heart failure is a progressive disease with a high mortality that approaches 50% at 5 years^{2,3} and at least 75% after an initial hospitalization⁴
- ❑ Patients with heart failure are also at high risk of recurrent major adverse cardiac events involving large vessels (heart attacks / strokes)

New therapies for chronic heart failure reduce recurrent hospitalizations due to cardiac decompensation, however they do not materially improve cardiac mortality or major ischemic events (heart attacks/strokes)

1. Muntner BEJ, et al. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. Circulation. Feb 19, 2019. 2. United States Food & Drug Administration. Treatment for Heart Failure: Endpoints for Drug Development. Draft Guidance. June 2019. 3. Taylor CJ, et al. Trends in survival after a diagnosis of heart failure in the United Kingdom 2000-2017: population based cohort study. BMJ. 2019;364:l223. 4. Shah KS, et al. Heart Failure with Preserve, Borderline, and Reduced Ejection Fraction; 5-Year Outcomes. JACC. 2017;Nov12.

Treatment Algorithm in Progressive Heart Failure

Progressive Vascular (Endothelial) Dysfunction and Heart Failure



1. GlobalData-PharmaPoint Heart Failure (2016); McMurray et al., 2012; Yancy et al., 2013, 2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure: An Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure.

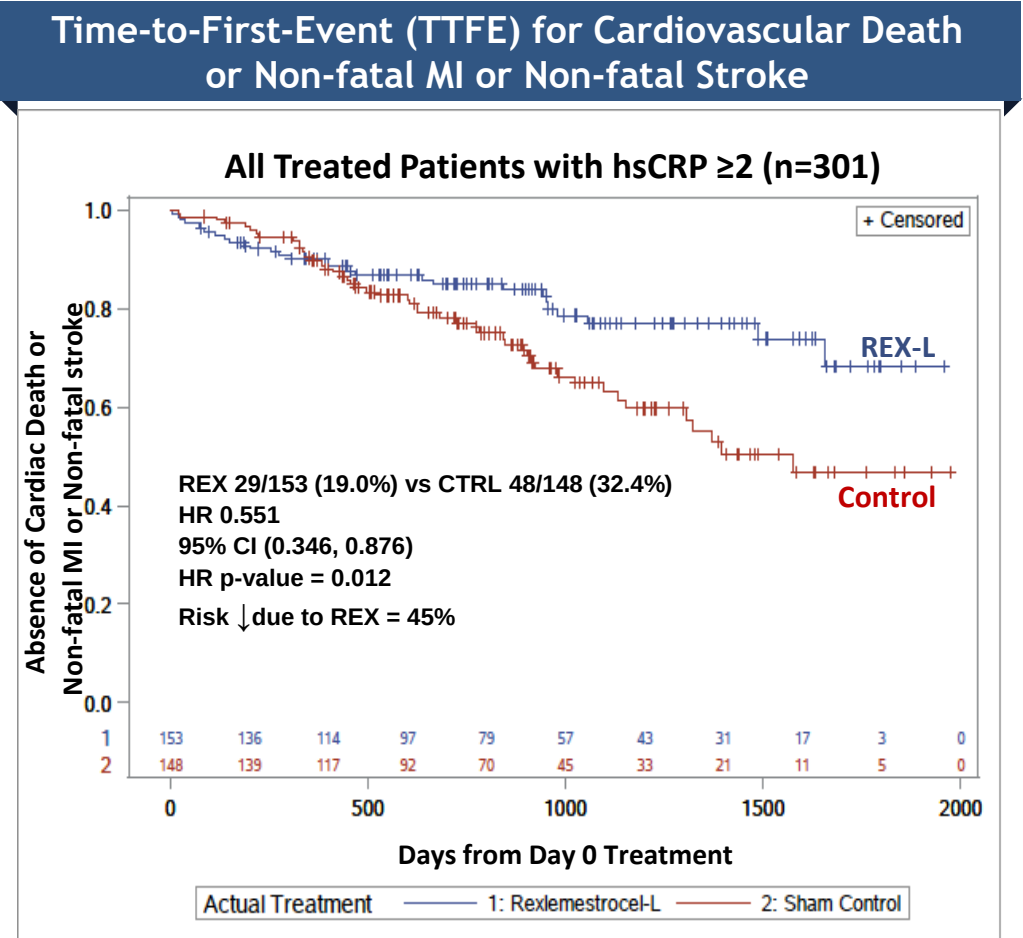
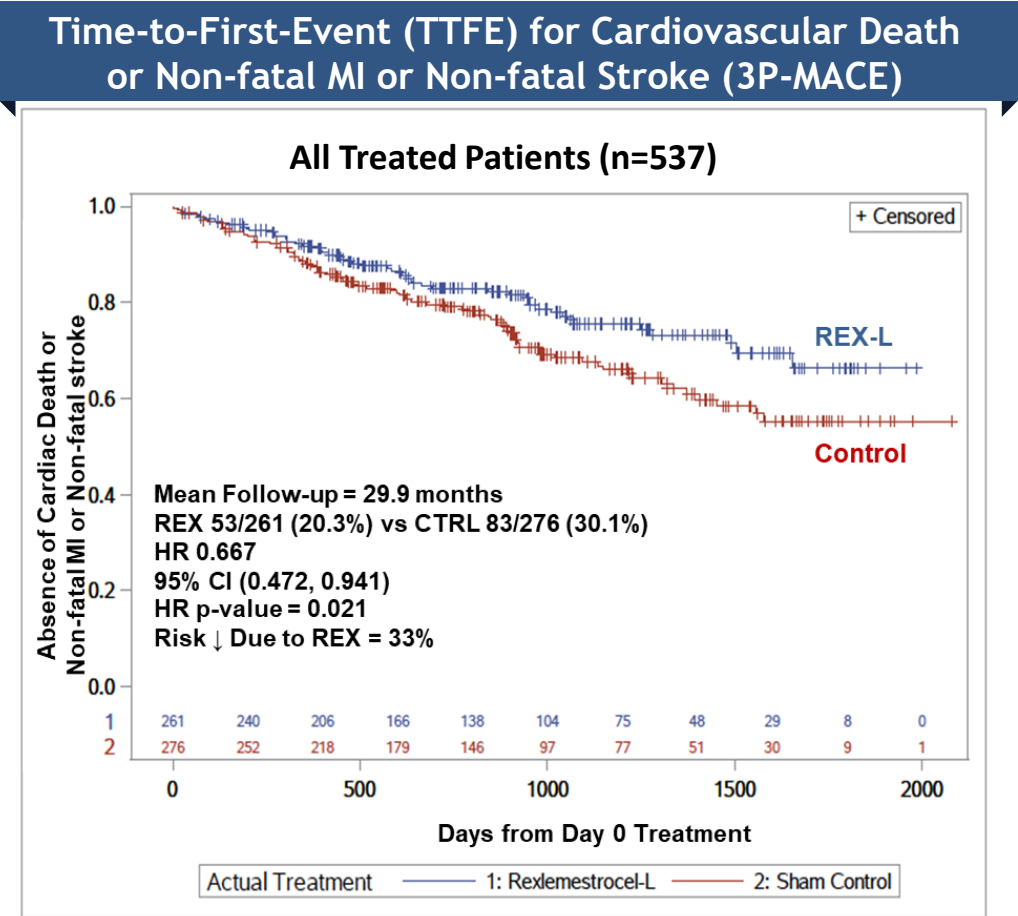
Rexlemestrocel-L: Phase 3 Trial in Heart Failure with Reduced Ejection Fraction (HFrEF)

Rexlemestrocel-L Improved Left Ventricular Systolic Function, as Measured by Left Ventricular Ejection Fraction (LVEF) at 12 Months: Potential Early Surrogate Endpoint

- In all treated patients (n=537) rexlemestrocel-L resulted in 52% greater increase in LVEF from baseline to 12 months compared with controls
- While both groups had similar LVEF at baseline (28.7% and 28.6%), at 12 months least squared mean change from baseline was 5.0 for the rexlemestrocel-L group and 3.3 for controls (p=0.021)
- In treated patients with CRP >2 (n=301) rexlemestrocel-L resulted in 86% greater increase in LVEF from baseline to 12 months compared with controls
- While both groups had similar LVEF at baseline (29.1% and 28.2%), at 12 months least squared mean change from baseline was 5.6 for the rexlemestrocel-L group and 2.9 for controls (p=0.005)

DREAM-HF Phase 3 Trial in HFrEF

Rexlemestrocel-L Reduced Incidence of 3-Point Composite MACE - CV Death, MI or Stroke - Compared to Controls Across All 537 Treated Patients, with Enhanced Effect in Those with Active Inflammation as Measured by CRP >2



MACE=Major Adverse Cardiovascular Event;
TTFE=Time To First Event; MI=Myocardial Infarction (Heart Attack)

The Mesoblast logo is a square divided into four quadrants by a white cross. The top-left quadrant is light blue, the top-right is medium blue, the bottom-left is dark blue, and the bottom-right is a very dark blue.

mesoblast

Thank You

Four horizontal white lines of decreasing length, centered below the 'Thank You' text, creating a stylized graphic element.