United States
Healthcare

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Edward Woo, CFA
(561) 327-9435
ewoo@ascendiant.com

NRx Pharmaceuticals, Inc.

Initiating Coverage with BUY and $4.00 Target

Large market opportunities for its NRX-101 drug to treat mental health disorders. We believe expected positive milestones and clinical data over the next year to be strong catalysts for stock.

COVERAGE INITIATION

Rating: BUY

Ticker: NRXP

Price: $0.85

Target: $4.00

Initiating with BUY: We are initiating coverage of NRx Pharmaceuticals with a BUY rating and a 12-month price target of $4.00. NRx is a clinical stage biopharmaceutical company developing drugs to treat mental health disorders.

Focused on Bipolar Disorder: Its main drug is NRX-101 (D-cylcoserine/Lurasidone) for the treatment of bipolar depression in patients with suicidality (the risk of suicide). NRX-101 aims to be the first oral therapeutic for the treatment of Bipolar Depression in patients with Acute Suicidal Ideation and Behavior ("ASIB") and Sub-Acute Suicidal Ideation and Behavior ("SSIB").

NRX-101: NRX-101 is a patented, fixed dose combination of D-cycloserine (DCS) and lurasidone. NRX-101 is a dual-targeted sequential therapy regimen consisting of an initial treatment with NRX-100 (intravenous ketamine) followed by 6-week treatment with NRX-101 (combined DCS and lurasidone). Ketamine is a generic drug and has been widely used for a long time as an antidepressant, although its effect does not last long (usually about a week). NRX-101 is designed to offer an oral, rapid-onset and sustained home-use therapy that can significantly extend ketamine's proven anti-suicidal and antidepressant benefits without its drawbacks.

Large market potential: There is no medicine approved to treat patients with bipolar depression suffering suicidal ideation. According to the NIH, an estimated 2.8% of the U.S. adult population had bipolar disorder in the past 12 months, and the lifetime prevalence is 4.4% of adults in the U.S. Lifetime suicide behavior occurs in 25% to 56% of people with bipolar depression.

Clinical trials: In Q2 2022, the company initiated enrollment in its Phase 2 trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidal Ideation & Behavior (SSIB) (not requiring hospitalization). Top-line data from this trial is expected by the end of 2022 or in Q1 2023. The company expects to initiate a registration trial (Phase 2b/3) for NRX-101 in patients with Bipolar Depression and acute suicidal ideation and behavior (ASIB) (requiring hospitalization) in Q4 2022 or Q1 2023. If the trials are successful, the company may be able to file a new drug application (NDA) with the FDA for NRX-101 by late 2023 or early 2024, with commercialization starting in 2024.

Clinical data can be catalyst: NRx anticipates starting/finishing its various clinical trials over the next year. We believe achieving key milestones and strong positive data will likely be catalysts for the stock.

However, challenges exist: NRx operates in a highly competitive environment and competes against a wide range of other drugs, therapeutics, and treatments. There is the chance that competing therapeutic treatments for bipolar disorder may be launched before the company's drugs are launched.

Positive high risks versus high rewards: Overall, concerns outweighed by growth prospects and valuation. NRx's main drugs still have long development roads left and the high risks of clinical trials failures, but we believe the ~billion dollars market potential presents high rewards for the risks. We believe the valuation for NRx is favorable particularly if it files its NDA in 2023, and receives FDA approval and begins commercialization in 2024.

Current valuation attractive: We calculate a 12-month price target for shares of NRx to be $4.00 based on a NPV analysis, representing significant upside from the current share price. We believe this valuation appropriately balances out the company's high risks with the company's high growth prospects and large upside opportunities.

Company Description

NRx Pharmaceuticals, based in Wilmington, DE, is a clinical stage biopharmaceutical company developing drugs to treat mental health disorders.

Stock Data

Exchange:	NasdaqGM
52-week Range:	0.49 – 10.39
Shares Outstanding (million):	68
Market cap ($million):	$58
EV ($million):	$33
Debt ($million):	$0
Cash ($million):	$25
Avg. Daily Trading Vol. ($million):	$1
Float (million shares):	39
Short Interest (million shares):	1
Dividend, annual (yield):	$0 (NA%)

Revenues (US$ million)

	2021A (Cur.)	2022E (Cur.)	2023E (Cur.)
Q1 Mar	0A	0A	0E
Q2 Jun	0A	0A	0E
Q3 Sep	0A	0E	0E
Q4 Dec	0A	0E	0E
Total	**0A**	**0E**	**0E**
EV/Revs	N/A	N/A	N/A

Earnings per Share (pro forma)

	2021A (Cur.)	2022E (Cur.)	2023E (Cur.)
Q1 Mar	(0.71)A	(0.21)A	(0.13)E
Q2 Jun	(6.43)A	(0.11)A	(0.12)E
Q3 Sep	(0.40)A	(0.14)E	(0.12)E
Q4 Dec	(0.80)A	(0.13)E	(0.12)E
Total	**(7.44)A**	**(0.58)E**	**(0.49)E**
P/E	N/A	N/A	N/A

Important Disclosures

Ascendiant Capital Markets LLC seeks to do business with companies covered by its research team. Consequently, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making an investment decision.

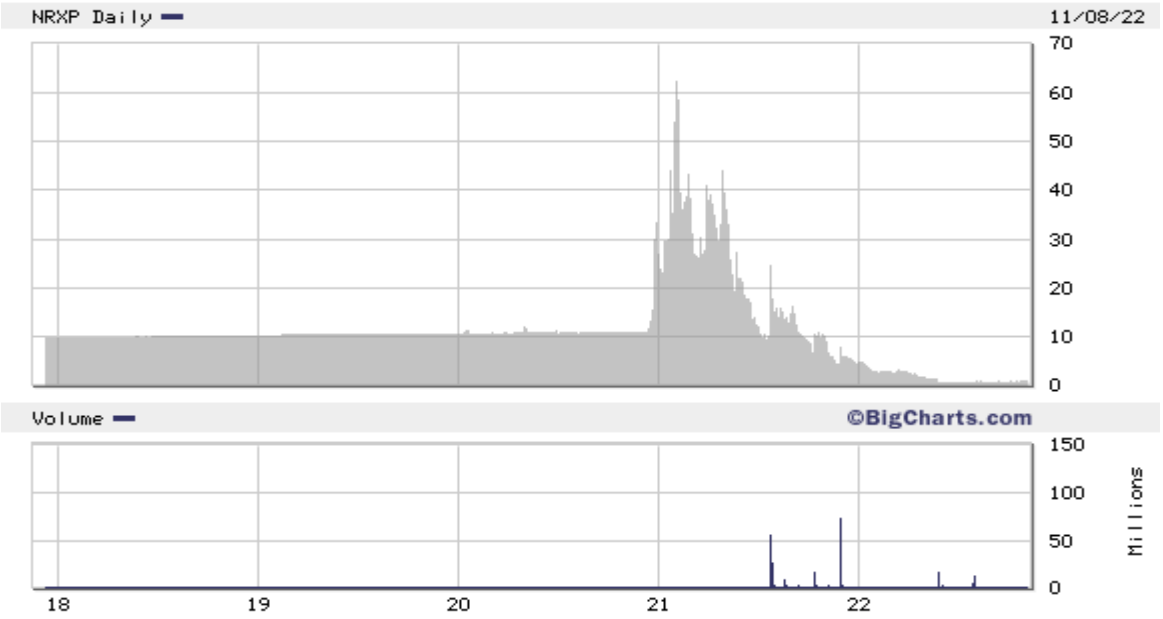
For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report, beginning on page 29.

Exhibit 1: NRx Pharmaceuticals, Inc. Stock Price (5-Years)

SPAC (Big Rock Partners Acquisition Corp.) IPO - 11/20/17

SPAC Merger Announcement (with NeuroRx, Inc.) - 12/14/20

SPAC Merger Completion (to form NRx Pharmaceuticals, Inc.) - 5/25/21



Source: https://bigcharts.marketwatch.com/

INVESTMENT THESIS

We are initiating coverage of NRx Pharmaceuticals with a BUY rating and a 12-month price target of $4.00.

NRx Pharmaceuticals, based in Wilmington, DE, is a clinical stage biopharmaceutical company developing drugs to treat mental health disorders. Its main drug is NRX-101 (D-cylcoserine/Lurasidone) for the treatment of bipolar depression in patients with suicidality (the risk of suicide). NRX-101 aims to be the first oral therapeutic for the treatment of Bipolar Depression in patients with Acute Suicidal Ideation and Behavior ("ASIB") and Sub-Acute Suicidal Ideation and Behavior ("SSIB").

NRX-101 is a patented, fixed dose combination of D-cycloserine (DCS) and lurasidone. NRX-101 is a dual-targeted sequential therapy regimen consisting of an initial treatment with NRX-100 (intravenous ketamine) followed by 6-week treatment with NRX-101 (combined DCS and lurasidone). Ketamine is a generic drug and has been widely used for a long time as an antidepressant, although its effect does not last long (usually about a week).

NRX-101 is intended for the treatment of both depression and acute suicidal ideation (thoughts) in individuals with bipolar disorder. This treatment is intended for rapid stabilization of individuals with acute suicidal ideation and behavior related to acute exacerbation of depressive symptoms in individuals with bipolar disorder.

NRX-101 has demonstrated a statistically-significant reduction in depression and suicidality in a randomized Phase 2 trial against an active comparator (lurasidone) and has been awarded FDA Breakthrough Therapy designation, a Special Protocol Agreement and a Biomarker Letter of Support.

In Q2 2022, the company initiated enrollment in its Phase 2 trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidal Ideation & Behavior (SSIB) (not requiring hospitalization). Top-line data from this trial is expected by the end of 2022 or in Q1 2023.

The company expects to initiate a registration trial (Phase 2b/3) for NRX-101 in patients with Bipolar Depression and acute suicidal ideation and behavior (ASIB) (requiring hospitalization) in Q4 2022 or Q1 2023. If the trials are successful, the company may be able to file a new drug application (NDA) with the FDA for NRX-101 by late 2023 or early 2024, with commercialization starting in 2024.

Exhibit 2: NRx Pharmaceuticals, Inc. Corporate Overview

Company Profile

NRx is a clinical-stage, small molecule pharmaceutical company which develops novel therapeutics for the treatment of central nervous system disorders and life-threatening pulmonary diseases. NRx is also developing NRX-100/101, the first sequential drug regimen for bipolar depression in patients with acute suicidal ideation and behavior (the "NRx Antidepressant Drug Regimen"). NRx Pharmaceuticals (Nasdaq: NRXP), formerly NeuroRx, is now traded on the Nasdaq Global Select Exchange.

Source: Company reports.

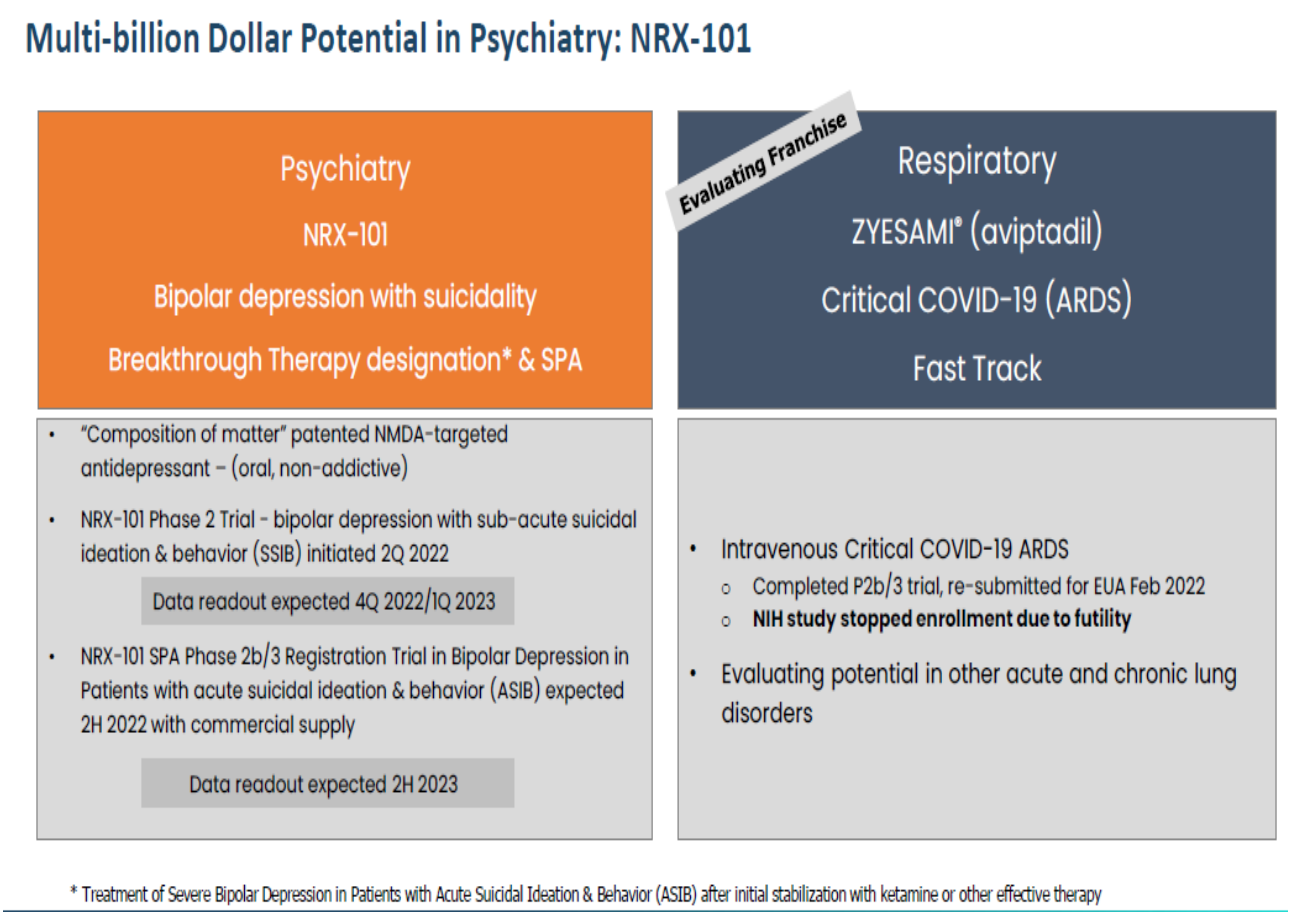
NRx was founded in 2015 by Dr. Jonathan Javitt and Dr. Daniel Javitt to develop drugs to treat psychiatric disorders based on Daniel Javitt's discovery of a synergistic effect when NMDA antagonists are combined with inhibitors of the brain's 5-HT2A receptor (i.e. SSRI antidepressants and atypical antipsychotic drugs). Daniel Javitt subsequently made the seminal observation that when an NMDA antagonist, specifically DCS, is combined with a traditional (serotonin-targeted) antidepressant or antipsychotic, the two drugs have a synergistic effect wherein antidepressant activity is enhanced and side effects are decreased.

NRX-100, an IV (intravenous) infusion of ketamine, is taken in conjunction with NRX-101, a fixed-dose combination oral capsule composed of DCS and lurasidone to maintain remission from acute suicidality in acutely depressed bipolar patients. The NRx Sequential Therapy takes advantage of the unique synergistic confluence of three FDA-approved drugs with long histories of safety: DCS, lurasidone, and ketamine.

NRx's goal is to offer patients the clinical benefit of rapid reduction in symptoms of depression and suicidal ideation that has been observed with ketamine, while not having ketamine's potential for abuse and psychosis, and required supervised administration. NRX-101 is designed to offer an oral, rapid-onset and sustained home-use therapy that can significantly extend ketamine's proven anti-suicidal and antidepressant benefits without its drawbacks.

NRx completed (in 2018) a Phase 2 clinical trial of NRX-101 in patients with Severe Bipolar Depression and Acute Suicidal Ideation and Behavior (ASIB) following initial stabilization with a single dose of ketamine (NRX-100) and saw a statistically significant reduction in depression (P=0.04) and suicidal ideation (P=0.02) compared to lurasidone alone over 42 days of treatment. If this statistically-significant advantage is replicated in the Phase 3 clinical trial, under the terms agreed to with the FDA in its Special Protocol Agreement (SPA), NRx aims to submit a NDA to the FDA for NRX-101 in the U.S. in late 2023 or early 2024.

Exhibit 3: NRx's Psychiatry Opportunities



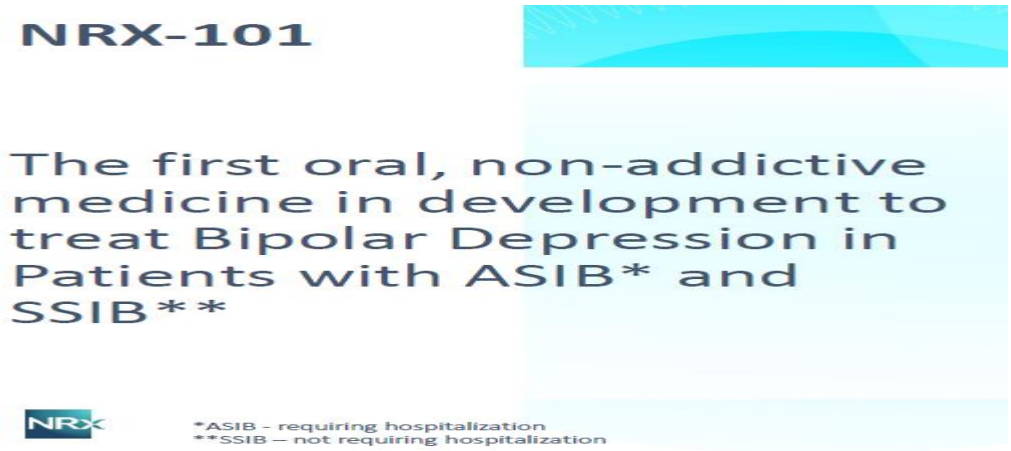
Source: Company reports.

Bipolar disorder, formerly known as manic depressive disorder (MDD), is an illness that causes notable changes in a person's mood, energy, and ability to think clearly. Bipolar depression (lows) is a common symptom of this mental illness. It is estimated that more than half of individuals with bipolar disorder will attempt suicide or have serious suicidal thoughts over their lifetime, usually occurring during their depressive phases.

Currently, the only FDA approved treatment for patients with Bipolar Depression and Acute Suicidal Ideation and Behavior (ASIB) is electroshock therapy, a procedure, done under general anesthesia, in which electric currents are passed through the brain, intentionally triggering a brief seizure. There is no medicine approved to treat patients with bipolar depression suffering suicidal ideation.

According to the NIH, an estimated 2.8% of the U.S. adult population had bipolar disorder in the past 12 months, and the lifetime prevalence is 4.4% of adults in the U.S. The risk of ASIB is uniquely high in patients during bipolar depressive episodes, compared to those with MDD (Major Depressive Disorder), thought disorders, and personality disorders. Lifetime suicide behavior occurs in 25% to 56% of people with bipolar depression.

Exhibit 4: NRX-101



Source: Company reports.

NRx's recent financial performance is reflective of its developmental stage. In its Q2 2022 report (on August 15, 2022), the company reported no revenue and net loss was $7.0 million. Operating expenses were $10 million, mainly due to drug development costs and general and administrative expenses. Q2 EPS was $(0.11). The major news in Q2 was the ending of its COVID-19 drug development (ZYESAMI) and restarting its psychiatry drug development (NRX-101).

The company does not provide specific quarterly financial guidance, but we believe that R&D expenses should increase as the company expands clinical trial activities. The company expects continued progress on its drug development milestones in 2022/23. We do not expect the company to experience revenue until its drugs make significant progress towards FDA approval (either from product sales or from the sales of drug marketing rights to new partners), which is likely at least a couple of years away.

We believe investors should be focused on its progress on its drug development, which will likely take at least a couple of years before a potential FDA approval. Within the next year, the company plans to complete its current Phase 2 trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidal Ideation & Behavior (SSIB) and to launch two Phase 3 trials for NRX-101 in patients

with Bipolar Depression SSIB (not requiring hospitalization) and acute suicidal ideation and behavior (ASIB) (requiring hospitalization) and we should get Top-Line data from these studies.

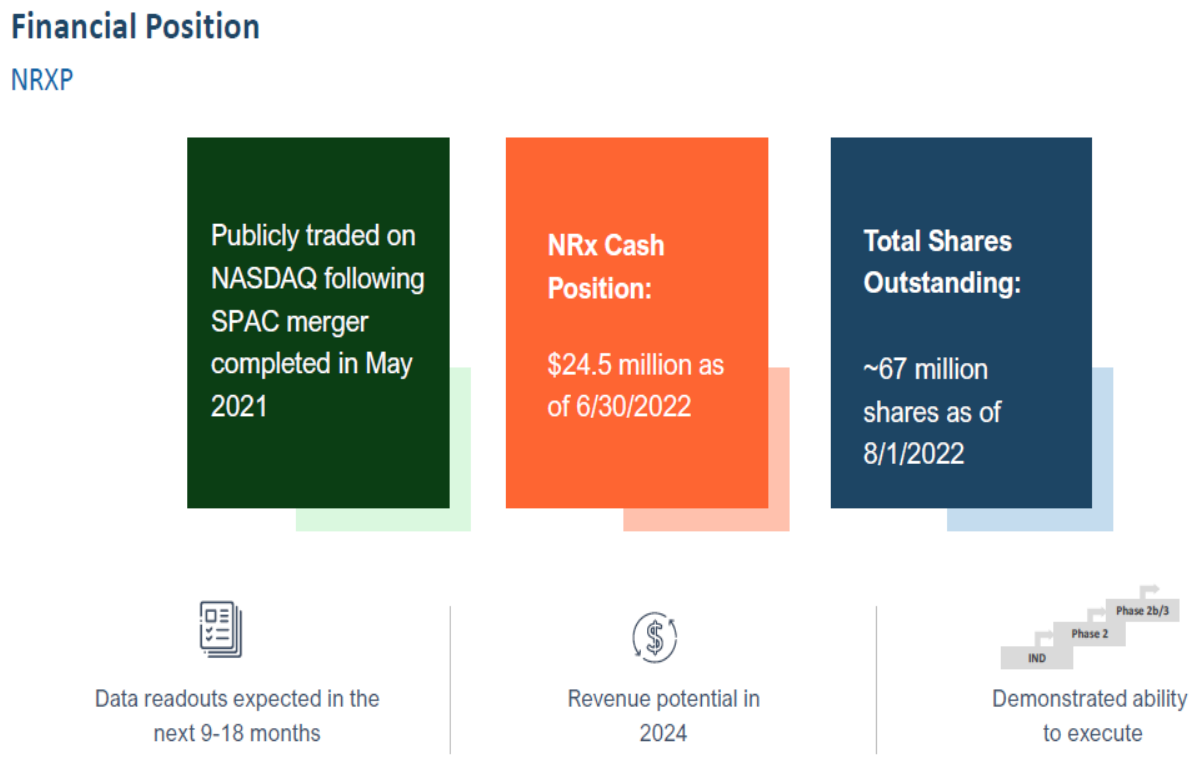
The company's balance sheet has $25 million in cash and no debt as of June 2022. In February 2022, the company raised ~$25 million (selling 7.8 million shares at ~$3.20 per share). In November 2022, the company just raised $11 million in debt. We believe the company has enough cash into Q4 2023, but we believe it will need to raise new capital in mid-2023. The company has guided to having enough cash into Q3 (August) 2023 (not factoring in its recent debt raise).

Our investment thesis factors in an uncertain drug development process and very competitive industry which is offset by the very large potential upside opportunities created from a successful drug. We believe that the current valuation for NRx has already factored in many of its risks (principally drug approval and successful commercialization) but is under valuing its overall growth prospects and product portfolio, resulting in a positive risk versus reward scenario for an investment in NRx.

We believe the current valuation is attractive.

Based on our expectations and assumptions and our NPV analysis, we calculate a 12-month price target for shares of NRx to be $4.00, representing significant upside from current share price. We believe this valuation appropriately balances out the company's high risks with the company's high growth prospects and large upside opportunities. We acknowledge that NRx is still at an early stage in its drug development and product commercialization, but we believe key milestones over the next year should be positive catalysts for the stock.

Exhibit 5: NRx Investment Highlights



Source: Company reports.

INVESTMENT RISKS

Long and Uncertain Drug Development Cycles

NRx is highly dependent upon securing drug approvals for its products in order to sell them (produce revenue). The drug development cycle can be long (average of 12 years), expensive (average of $350 million), complicated, and uncertain. On average only about 10% of drugs entering clinical trials ever make it to final approval. Because NRx's main drug (NRX-101) is still early in development in various Phase 2/3 trials, there are still significant risks and a long and uncertain time horizon to receive FDA approval. We estimate that it likely will be at least two years before its NRX-101 drug can receive FDA approval. With a high likelihood of binary outcomes (either success or failure), the risks are high but the potential rewards can also be very high as well.

Product Commercialization Risks

Even after obtaining drug approvals, there is still a chance that commercial success will not be achieved (due to competition, changes in the market, lack of reasonable reimbursements, or lack of market acceptance). While there are currently many therapeutics to treat mental health, NRx aims to develop a much better drug for Bipolar Disorder treatment. There is the chance that other potential therapeutic treatments and options may be developed and launched before the company's drugs are launched. In addition, NRx will need to replace existing therapies and treatments being used currently as standards of care (especially since there are already many different drug and therapies being used). Like most health care drugs, the company will also need to get suitable insurance and government reimbursements for its products.

High Level of Competition

NRx operates in a highly competitive environment and competes against a wide range of other biopharmaceutical companies that are attempting to replicate or already have comparable treatments for mental health and Bipolar Disorder as the company's drugs. Some of these competitors are much larger or have greater resources, and proprietary technology; which could result in lower projected sales for its drugs and higher costs, reduced margins, and lowered profitability for the company. Even if NRx were to be successful with its drug development, its products will have to compete with existing or new standards of care.

Concentrated Product Pipeline

The company is currently developing one main drug therapeutic (NRX-101). Though NRX-101 is being aimed for 2 indications, to treat bipolar disorder in patients with Acute and Sub-Acute Suicidal Ideation & Behavior (ASIB & SSIB) and the company plans additional indications in the future (such as PTSD (post-traumatic stress disorder)), the company is very leveraged to the success or failure of NRX-101. If NRx were to experience difficulties with development of any of these, then it may have a material negative impact on its business and financials as there are no meaningful products which can offset.

Coronavirus and Economic Uncertainties

While healthcare costs tends to be less correlated with economic activity and income levels due to their nondiscretionary nature, major deterioration in economic conditions tends to result in an overall decline in consumer spending. This was demonstrated during the 2008 and 2009 Great Recession and global economic slowdown. While consumer spending levels and economic conditions have rebounded since and have been strong the past several years, the global macroeconomic environment can change significantly quickly as was shown with the start of the COVID-19 pandemic in March 2020. Since then, due to huge government stimulus the U.S. economy is now very strong (though there has been some recent slowdowns in 2022). However, the pandemic has still negatively impacted many businesses and has been a huge disruption to the U.S. (and global) economy. This includes biotechs as many have seen FDA drug development reviews, feedback, and approvals delayed along with disruptions in clinical trials. Further economic weakness may result in depressed enterprise and consumer spending levels; this may have a negative impact on NRx, its business partners, government, and consumers.

Capital Markets Risks

We believe NRx has enough cash to fund its operations into Q4 2023, but we estimate that it will need to raise capital by Q3 2023. We believe that it will be at least several years before the company can be cash flow self-sufficient from operations. Many

biopharmaceutical companies fund their operations from the sale of equity or debt capital until their products reach commercial success or until they sell off the commercial rights to other companies. Biopharmaceuticals ("biotechs") valuations tend to fluctuate widely, and they have been very weak in 2022 (mainly due to a weak general stock market and larger weakness and volatility for small/microcap stocks), there is always the chance that market interests and valuations for companies in this industry to further decline significantly. The share price weakness and volatility since its SPAC merger was announced in December 2020 (with a stock price range of $0.49 – 64.20 since (though we note most of the extreme price volatility and overall declines was concentrated in the periods 6 months prior to the merger completion (deal was announced December 2020 and closed in May 2021) and 6 months after)) in NRx share price may make capital raising much more difficult and expensive.

VALUATION

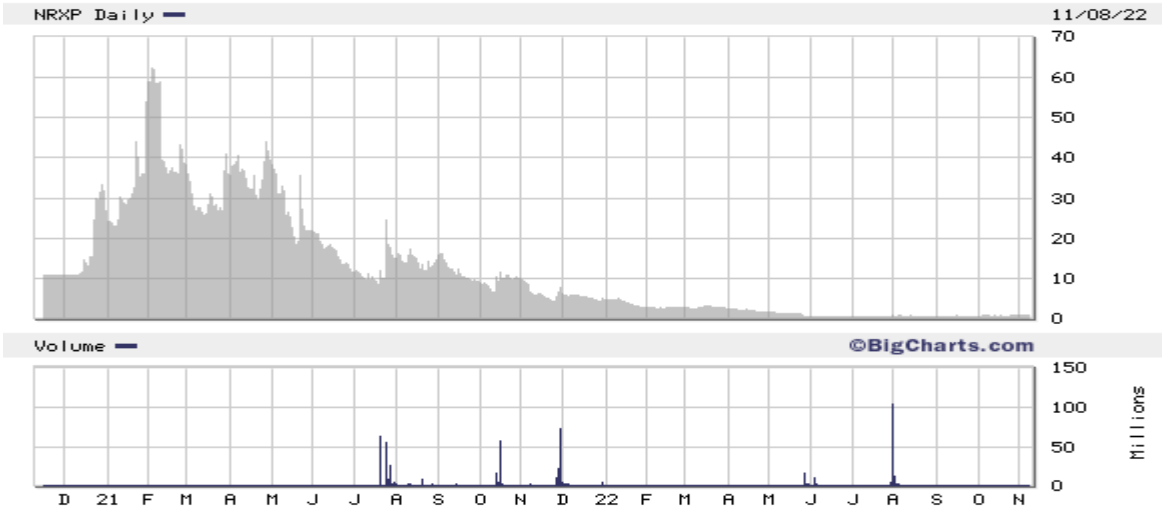
We are initiating coverage of NRx Pharmaceuticals with a BUY rating and a 12-month price target of $4.00, which is based on a NPV analysis. As the company is a clinical stage drug development company, it currently generates no revenue and significant losses so traditional valuation metrics are not useful. We believe a more accurate valuation should take into consideration the potential value of its product pipeline. We do acknowledge that this valuation is complex and requires a large number of forward assumptions that we have to estimate that may be imprecise and may vary significantly from actual results. This is particularly so for a company like NRx which is still in early clinical trials with its one main drug (NRX-101).

However, we believe our assumptions are fair and provide a reasonable basis for our valuation analysis. Our analysis considers future estimated revenue from each of its major product pipelines (based on estimated future sales, a probability rate of success, and discounted this back to a current value), currently focused on its NRX-101 drug to treat bipolar disorder in patients with Acute and Sub-Acute Suicidal Ideation & Behavior (ASIB & SSIB). We apply a high discount rate and a low probability of success to capture the high uncertainties associated generally with drugs in development. We then added up the values, made an assumption about future investments required and allocated the value based on current share count. Based on our NPV analysis, we arrived at our 12-month price target of $4.00, which we believe appropriately balances out the company's risks with its high growth prospects.

NRx's share price has been weak (and highly volatile) since it completed its reverse merger with a SPAC in May 2021. YTD in 2022, NRx's share price is –82% (was $4.78 on 12/31/21) to the current share price of $0.85 (as of 11/8/22). The share price has traded between $0.49 and $10.39 in the past year and $0.49 and $1.70 in the past 6 months, with most of the weakness occurring after the company announced the ceasing of clinical trials and development of its COVID-19 drug ZYESAMI in May 2022. We also believe the share price weakness is due to general stock price weakness and volatility with small/microcap biotech stocks in 2022.

However, we believe that there are near term catalysts that can drive the stock (particularly for key milestones expected in 2022/23). As the company is likely to make significant progress (and milestones) in its drug development and product commercialization over the next several years, we believe this will result in much improved visibility into future cash flows and higher share price. Although it is very likely that the company will have to keep raising capital to achieve its product development goals, we believe that positive progress will make future financings accretive to current shareholders.

Exhibit 6: NRx Pharmaceuticals, Inc. Stock Price (2-Years since SPAC merger announcement on 12/14/20)



Source: https://bigcharts.marketwatch.com/

We believe the company has enough cash through Q3 2023, but that it will need to raise capital in mid-2023 to fund clinical trials and to achieve its strategic goals.

We expect valuations for NRx to improve as visibility into cash flow generation becomes clearer (though we acknowledge that product commercialization is likely at least 2 years away), resulting in significant upside to the current share price. We also want to note that investors' interest in drugs development to treat and manage mental disorders are high with many companies in this area (including those with existing and approved drugs in the market) due to the large market opportunities given lack of good treatment options and the high incidence rate.

Exhibit 7: Company Valuation (DCF) (in millions)

Valuation of Products (in millions)

Product	Estimated NPV	% of Success	Calculated NPV	Discount Rate	Estimated Annual Sales	% of Market Share	Market Potential per year
NRX-101 (D-cylcoserine/Lurasidone)	$ 336	20%	$ 1,680	25%	$ 420	35%	$ 1,200
Total	**$ 336**						

Estimated additional investments (& debt) required	$	65
Current Value for existing shareholders	$	271
Shares Outstanding (mils)		68
Estimated Value per share	**$**	**4.00**

Source: Ascendiant Capital Markets estimates

COMPANY

NRx Pharmaceuticals, based in Wilmington, DE, is a clinical stage biopharmaceutical company developing drugs to treat mental health disorders. Its main drug is NRX-101 (D-cylcoserine/Lurasidone) for the treatment of bipolar depression in patients with suicidality. NRX-101 aims to be the first oral therapeutic for the treatment of Bipolar Depression in patients with Acute Suicidal Ideation and Behavior ("ASIB") and Sub-Acute Suicidal Ideation and Behavior ("SSIB"). The company was developing a COVID-19 therapeutic (ZYESAMI) since March 2020 (the beginning of the pandemic), but ceased development work in May 2022 when ZYESAMI was deemed ineffective in a clinical trial.

The company was initially founded in November 2017 (when it had its IPO raising $60 million (6 million units at $10 per unit)) as Big Rock Partners Acquisition Corp. Big Rock Partners was a blank check company (SPAC or Special Purpose Acquisition Company) formed for the purpose of entering into a merger, stock exchange, asset acquisition, stock purchase, recapitalization, reorganization, or other similar business combination with one or more businesses or entities.

In December 2020, the company announced its merger with NeuroRx, Inc., a private clinical stage, small molecule pharmaceutical company developing therapeutics for the treatment of COVID-19 (ZYESAMI) and Bipolar Depression (NRX-100, 101). NeuroRx was founded in 2015 by Dr. Jonathan Javitt and Dr. Daniel Javitt to develop drugs to treat psychiatric disorders. NeuroRx's mental health drug portfolio is based upon scientific discoveries of Daniel Javitt, PhD, M.D., a Professor of Psychiatry at Columbia University and a co-founder of NeuroRx (he is still on the Board of Advisors to the company). Daniel Javitt's brother Jonathan Javitt, M.D., M.P.H. (a founder of seven successful healthcare IT and biopharma startups with public exits) was a co-founder of the company, was the long time CEO (up until March 2022), and is still currently the Chief Scientist of the company.

In May 2021, the company completed its acquisition of NeuroRx and the newly combined company was renamed NRx Pharmaceuticals, Inc. The merger was accounted for as a reverse recapitalization ("reverse merger") so BRPA is treated as the acquired company and NeuroRx is treated as the acquirer for financial reporting purposes (so historical financials before the merger were restated to reflect NeuroRx's financials).

Exhibit 8: NRx's Management Team

Leadership Team

Committed to rapid, cost efficient, and impactful drug development

Stephen Willard, JD – Chief Executive Officer and Director

30+ years of management of publicly traded biotechnology companies, with a strong background in law and finance. Served in CEO roles such as Cellphire Therapeutics, and Flamel Technologies, now Avadel Pharmaceuticals and has held leadership and director roles at the FDIC and on the board of E*Trade Financial. Mr. Willard currently serves on the National Science Board as a presidential appointee and has practiced law in New York, London, and Washington, D.C.

Seth Van Voorhees, PhD, MBA – Chief Financial Officer

30+ years of finance and accounting experience, including serving as CFO of PDS Biotechnology, Research Frontiers and American Pacific. Investment banking experience supporting chemical/pharmaceutical clients

Robert Besthof, MIM – Head of Operations and Chief Commercial Officer

Neuroscience & specialty drug development. Former Global VP (Commercial), Pfizer Neuroscience. Led major portfolios in Psychiatry incl. Pristiq / Zoloft. Affiliate & global positions at Lilly, Wyeth, Pfizer

Randy Guggenheimer, MBA – Chief Business Officer

25 years in Life Science Investment Banking. Senior positions at Lehman Brothers, Dresdner. Kleinwort Wasserstein. Significant experience in life sciences financings, M&A

Rick Panicucci, PhD – CMC and Technical Operations Advisor

25 years manufacturing leadership. Head of CCP, Novartis. VP of Manufacturing, WuXi Apptec

Michael Kunz, General Counsel & Corporate Secretary

30+ years legal and fiduciary leadership in biopharma, energy and project finance. Previous roles include general counsel positions at Rolls-Royce Power Ventures, Ltd. (London), Burmeister & Wain Scandinavian Contractors (BWSC-Denmark) and 10 years private practice with Dewey Ballantine.

Molly Cogan – Senior Director, Global Communications & Government Affairs

20+ years international public affairs and senior communications leadership in healthcare, population health, digital health tech, and private equity

Jul. 13, 2022 News - Press Releases

NRx Pharmaceuticals Announces the Appointment of Stephen Willard, Chief Executive Officer and Director

- Extensive experience in Law, Finance, and Management of Public and Private Biotechnology Companies
- Proven track record of creating value for shareholders
- National Science Board Presidential Appointee, 2018-2024
- Former roles at Federal Deposit Insurance Corporation (FDIC) and E*Trade Financial

Share

NRx Pharmaceuticals Appoints Seth Van Voorhees, PhD, as Chief Financial Officer and Treasurer

Posted on June 8, 2022 by Drew Evans

RADNOR, Pa., June 7, 2022 – NRx Pharmaceuticals, Inc. (Nasdaq: NRXP), a clinical-stage biopharmaceutical company, announced today that the company's Board of Directors appointed Seth Van Voorhees, Ph.D. as Chief Financial Officer and Treasurer effective June 13, 2022.

Jonathan C. Javitt, MD, MPH

Co-Founder, Chief Scientist

25 years in drug development

Participated in 6 successful drug and device launches

Blockbuster drugs at Merck, Allergan, Eyetech

Presidential-commissioned White House health advisor

Prof. Johns Hopkins University

Source: Company reports.

PRODUCT

The company's main product NRX-101 (D-cylcoserine/Lurasidone) is being developed for the treatment of bipolar depression in patients with suicidality. Suicidality is the risk of suicide, usually indicated by suicidal thoughts, intent, plans, gestures, or attempts.

NRX-101 is a patented, fixed dose combination of D-cycloserine (DCS) and lurasidone. NRX-101 is a dual-targeted sequential therapy regimen consisting of an initial treatment with NRX-100 (intravenous ketamine) followed by 6-week treatment with NRX-101 (combined DCS and lurasidone). Ketamine is a dissociative anesthetic that has some hallucinogenic effects. Dissociatives are a subclass of hallucinogens which distort perception of sight and sound and produce feelings of dissociation from the environment. Ketamine is a generic drug and has been widely used for a long time as an antidepressant, although its effect does not last long (usually about a week). Consuming ketamine regularly or repeatedly can lead to increased tolerance (diminished effects) and dependence/addiction to the drug. Ketamine is a DEA (Drug Enforcement Administration) Schedule III (moderate to low potential for physical and psychological dependence) non-narcotic substance under the Controlled Substances Act.

NRX-101 is intended for the treatment of both depression and acute suicidal ideation (thoughts) in individuals with bipolar disorder. This treatment is intended for rapid stabilization of individuals with acute suicidal ideation and behavior related to acute exacerbation of depressive symptoms in individuals with bipolar disorder, followed by longer term stabilization to permit resolution of the crisis.

NRX-101 has demonstrated a statistically-significant reduction in depression and suicidality in a randomized Phase 2 trial against an active comparator (lurasidone) and has been awarded FDA Breakthrough Therapy designation, a Special Protocol Agreement and a Biomarker Letter of Support.

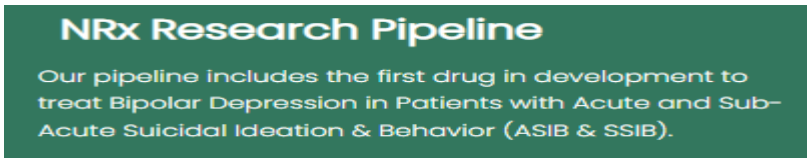
From the founding of the company in 2015 to 2019, the company was developing NRX-101, but took a pause in development during the COVID-19 pandemic (2020 and 2021) due to difficulties with operations and its ability to do clinical trials. In 2022, the company re-initiated its development of NRX-101 as part of its renewed focus on its psychiatry franchise.

In Q2 2022, the company initiated enrollment in its Phase 2 trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidal Ideation & Behavior (SSIB) (not requiring hospitalization). Top-line data from this trial is expected by the end of 2022 or in Q1 2023.

The company expects to initiate a registration trial (Phase 2b/3) for NRX-101 in patients with Bipolar Depression and acute suicidal ideation and behavior (ASIB) (requiring hospitalization) in Q4 2022 or Q1 2023. If the trials are successful, the company may be able to file a new drug application (NDA) with the FDA for NRX-101 by late 2023 or early 2024, with commercialization starting in 2024.

The company was also developing a COVID-19 therapeutics (ZYESAMI (aviptadil)) since March 2020 (the beginning of the COVID-19 pandemic). ZYESAMI is a drug therapeutic aimed at hospitalized patients with acute respiratory failure due to COVID-19. The company ceased development work in May 2022 when ZYESAMI was deemed ineffective in a Phase 3 clinical trial. ZYESAMI was being developed in collaboration with Relief Therapeutics. The company is evaluating its options for ZYESAMI and has stopped development and funding of clinical trials for ZYESAMI.

Exhibit 9: NRx's Product Pipeline



NRx R&D Pipeline

Indication	Compound	Pre-clinical	Phase 1	Phase 2	Phase 3	Regulatory Interactions
PSYCHIATRY						
Bipolar Depression with Suicidal Ideation and Behavior						
Severe Bipolar Depression in patients with ASIB	NRX-100 / NRX-101™	Breakthrough Therapy Designation, SPA, Biomarker Letter of Support				
Bipolar Depression in patients with SSIB	NRX-101™					
RESPIRATORY/COVID-19						
Critical COVID-19 / Acute Respiratory Failure	Intravenous ZYESAMI® (Aviptadil)	Fast Track		EUA Declined – for post-hoc subgroup		
Critical COVID-19 / Acute Respiratory Failure – NIH	Intravenous ZYESAMI® (Aviptadil)	Evaluating Franchise		Enrollment Discontinued due to futility		
Severe COVID-19	Inhaled ZYESAMI® (Aviptadil)			Study Discontinued		
ARDS						
Acute Respiratory Distress Syndrome	VIP	Investigator Initiated Study				Data and rights held by The Research Foundation for the State University of New York; NRx has a license

Source: Company reports.

NRx's psychiatric therapeutics portfolio is based upon the scientific discoveries of Dr. Daniel Javitt in 1987, discovering the role of blocking the brain's NMDA receptor (a molecule on the surface of brain cells) in producing psychosis (abnormal condition of the mind that results in difficulties determining what is real and what is not real). NRx was founded in 2015 by Dr. Jonathan Javitt and Dr. Daniel Javitt to develop drugs to treat psychiatric disorders based on Daniel Javitt's discovery of a synergistic effect when NMDA antagonists are combined with inhibitors of the brain's 5-HT2A receptor (i.e. SSRI antidepressants and atypical antipsychotic drugs). SSRI (Selective Serotonin Reuptake Inhibitor) antidepressants are a type of antidepressant that have been shown to increase levels of serotonin within the brain. Serotonin is a neurotransmitter that is often referred to as the "feel good hormone". Atypical antipsychotic drugs are second generation antipsychotics (SGAs) and serotonin–dopamine antagonists (SDAs).

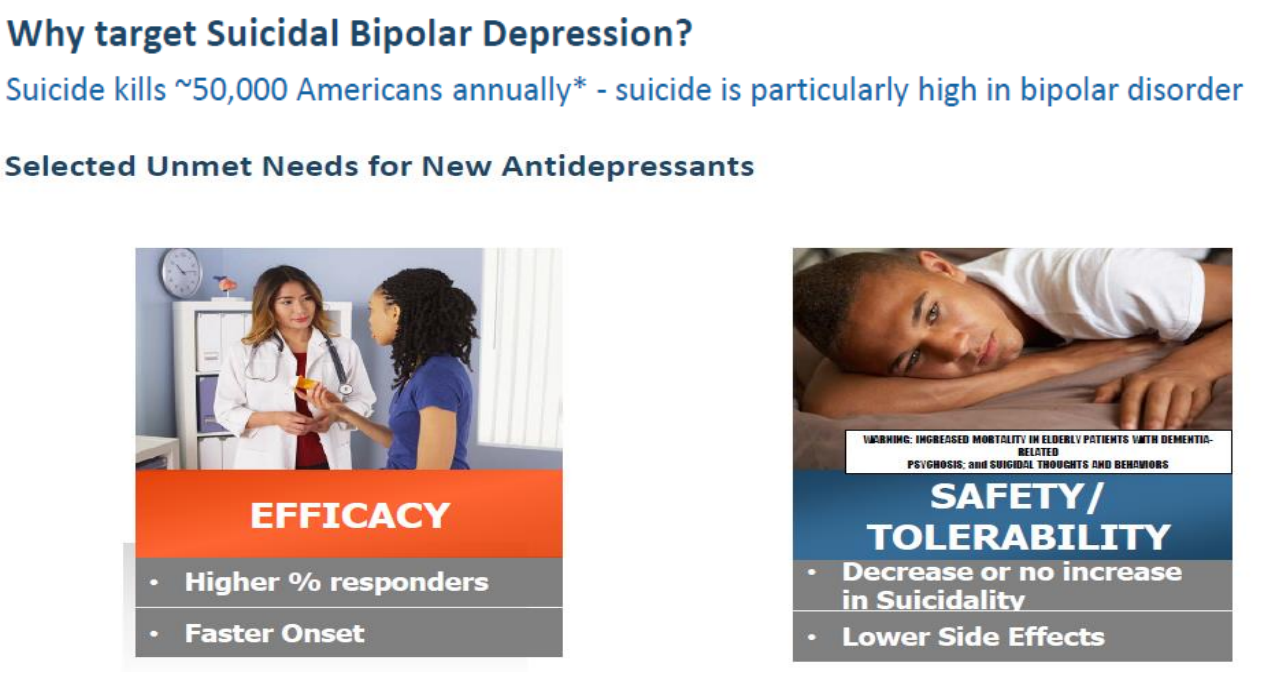
NMDA receptor antagonists (such as ketamine and D-Cycloserine) are a class of drugs that work to antagonize, or inhibit the action of, the N-Methyl-D-aspartate receptor (NMDAR). They are commonly used as anesthetics for animals and humans; the state of anesthesia they induce is referred to as dissociative anesthesia.

About 10 years after Daniel Javitt's original discovery, it was learned that NMDA inhibition is the mechanism by which ketamine, dextromethorphan, and other NMDA antagonists exert their antidepressant effects. Daniel Javitt subsequently made the seminal observation that when an NMDA antagonist, specifically DCS, is combined with a traditional (serotonin-targeted) antidepressant or antipsychotic, the two drugs have a synergistic effect wherein antidepressant activity is enhanced and side effects are decreased.

This synergy has now been demonstrated in both laboratory rodent behavioral experiments and in multiple Phase 2 clinical trials. Dr. Daniel Javitt observed that when patients with depression were treated with D-Cycloserine (DCS), an NMDA antagonist, in combination with antidepressants, they increased antidepressant effect, but did not exhibit the hallucinations and other NMDA effects previously reported with DCS. He further observed that DCS appeared to blunt some of the antidepressant side effects (akathisia) common to all known serotonin-targeted anti-depressants. Drugs that inhibit the brain's NMDA receptor without ketamine's limitations, have generated substantial interest, and have been explored for the treatment of the above conditions since the finding that ketamine has potent effects in reducing depression and suicidal ideation.

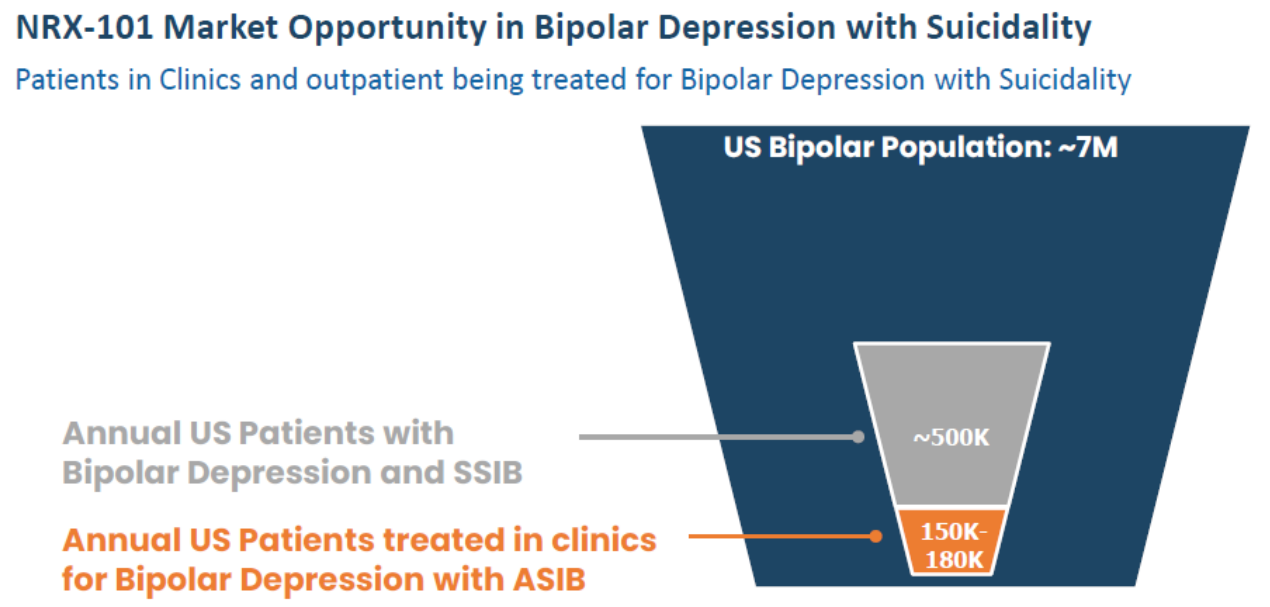
NRx believes that NRX-101 combined molecules may yield a competitive advantage to use NMDA-inhibiting drugs for this purpose, as other compounds may be limited by adverse elements such as neurotoxicity (with prolonged use), hallucinations, potential habituation (i.e. addictive properties), blood pressure elevations, and/or lack of oral bioavailability. The scientific findings showed that some of the side effects of a NMDA drug can be blocked by the 5-HT 2A drug and, in turn, the NMDA component can block the akathisia, a known side effect of 5-HT 2A -blocking drugs which is known to predispose to suicide.

Exhibit 10: Targeting Suicidal Bipolar Depression Risks



Source: Company reports.

Exhibit 11: Bipolar Depression Suicide Market Opportunities



Source: Company reports.

Bipolar disorder, formerly known as manic depressive disorder, is an illness that causes notable changes in a person's mood, energy, and ability to think clearly. People suffering with bipolar disorder experience high and low moods—known as mania (highs) and depression (lows). These mood swing changes are generally more extreme, volatile, and different then the mood changes most people experience. Bipolar depression (lows) is a common symptom of this mental illness. It is estimated that, more than half of individuals with bipolar disorder will attempt suicide or have serious suicidal thoughts over their lifetime usually occurring during their depressive phases.

Currently, the only FDA approved treatment for patients with Bipolar Depression and Acute Suicidal Ideation and Behavior (ASIB) is electroshock therapy, a procedure, done under general anesthesia, in which electric currents are passed through the brain, intentionally triggering a brief seizure. There is no medicine approved to treat patients with bipolar depression suffering suicidal ideation.

According to the NIH, an estimated 2.8% of the U.S. adult population had bipolar disorder in the past 12 months, and the lifetime prevalence is 4.4% of adults in the U.S. The risk of ASIB is uniquely high in patients during bipolar depressive episodes, compared to those with MDD (Major Depressive Disorder), thought disorders, and personality disorders. Lifetime suicide behavior occurs in 25% to 56% of people with bipolar depression. It is possible that a significant portion of the approximately 46,000 deaths in 2020 from suicide in the U.S. were associated with bipolar depression.

Furthermore, according to the CDC, the COVID-19 pandemic increased many of the risk factors for suicide. Patients with bipolar depression are 20-30 times more likely to attempt suicide than the general population. Some epidemiological study data suggests that over the course of 5 years, approximately 1 in 5 patients suffering from bipolar depression may attempt suicide or have serious thoughts about attempting suicide. Those who have attempted suicide are at significantly higher risk to experience another suicide attempt or die by suicide.

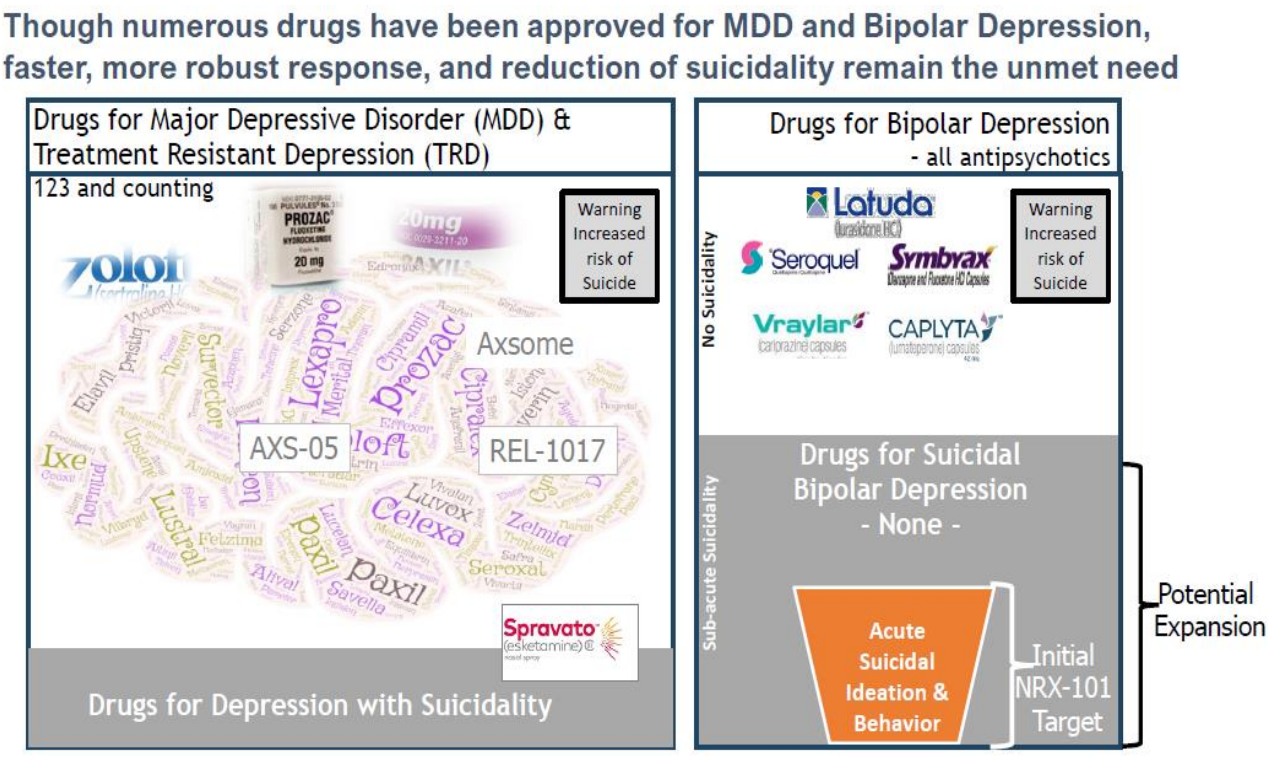
Despite its lethal characteristics, there are no approved pharmacologic treatments for patients with ASIB in bipolar depression. As a result, electroconvulsive therapy (ECT is a procedure that uses a mild electrical current to cause a brief seizure), often combined with inpatient psychiatric care, remains the only FDA-approved treatment for patients with ASIB in bipolar depression, despite ECT's well-documented side effects that include memory loss and confusion, along with its high cost.

In recent years, several combined D2/5-HT2a antagonists have been shown to have efficacy in treating bipolar depression (olanzapine/ fluoxetine combination, quetiapine, and lurasidone) with treatment guidelines endorsing common use as first-line standard-of-care treatment in acute bipolar depression. While these medications are effective at reducing overall symptoms of depression, they do not specifically reduce suicidal ideation, and may potentially increase the risk of suicide.

In the two bipolar depression registration studies of lurasidone, individuals with active suicidal ideation were specifically excluded because of concerns regarding the possibility of exacerbating suicidality. Similarly, acutely suicidal patients are routinely excluded from clinical trials of other experimental anti-depressive agents. Thus, ASIB in bipolar depression represents a major unmet medical need that must frequently be treated with voluntary or involuntary hospitalization under highly supervised conditions and in some cases the use of ECT.

Whereas all approved drugs for depression act primarily through monoaminergic mechanisms (working on monoamine neurotransmitters such as serotonin, dopamine, norepinephrine, epinephrine, and histamine), the discovery that ketamine can have a rapid and profound effect on depression and suicidality led to the realization that the glutamate system and the N-methyl-D-aspartate receptor (NMDAR) may also play an important role in depression and suicidality.

Exhibit 12: Unmet Need for Bipolar Depression Suicidality



Source: Company reports.

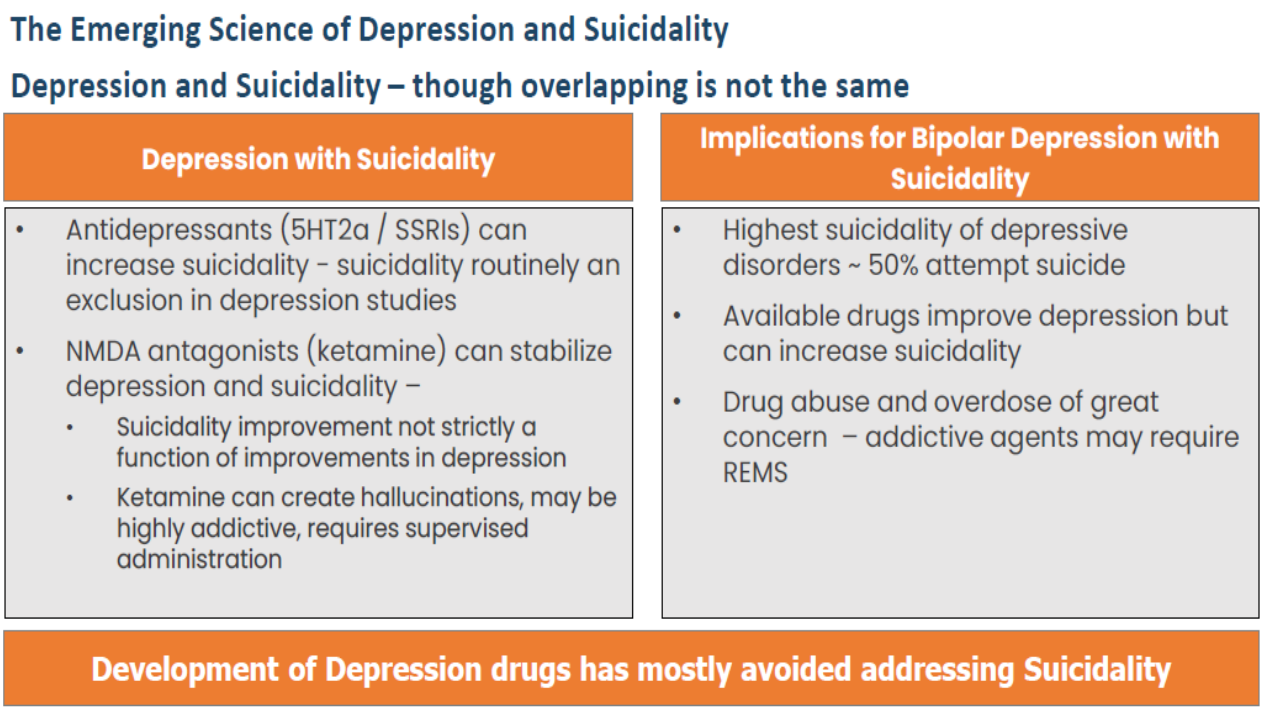
NRX-101 is part of NRx's investigational medicine regimen of RNX-100 (ketamine) and NRX-101, which if approved by the FDA, would be the first medicine regimen to treat Severe Bipolar Depression in Patients with Acute Suicidal Ideation and Behavior (ASIB). The regimen starts with an initial stabilization of NRX-100 (ketamine), patients who respond and are no longer acutely suicidal and depressed are then treated with NRX-101.

NRX-101 is a patented, oral fixed-dose combination of two FDA-approved generic drugs: D-cycloserine (DCS), an NMDA receptor modulator; and Lurasidone, a 5-HT2a receptor antagonist. NRx's registrational trial for NRX-101 focuses on patients with bipolar depression who require hospitalization due to their Acute Suicidal Ideation & Behavior (ASIB). Such patients will receive an initial single dose of ketamine (NRX-100) to stabilize their condition, those that achieve initial stabilization will receive NRX-101 or an active comparator.

A separate trial is studying patients with bipolar depression and sub-acute suicidal ideation and behavior (SSIB), which are being treated in the outpatient setting, as they do not require hospitalization. These patients will only receive NRX-101 or an active comparator.

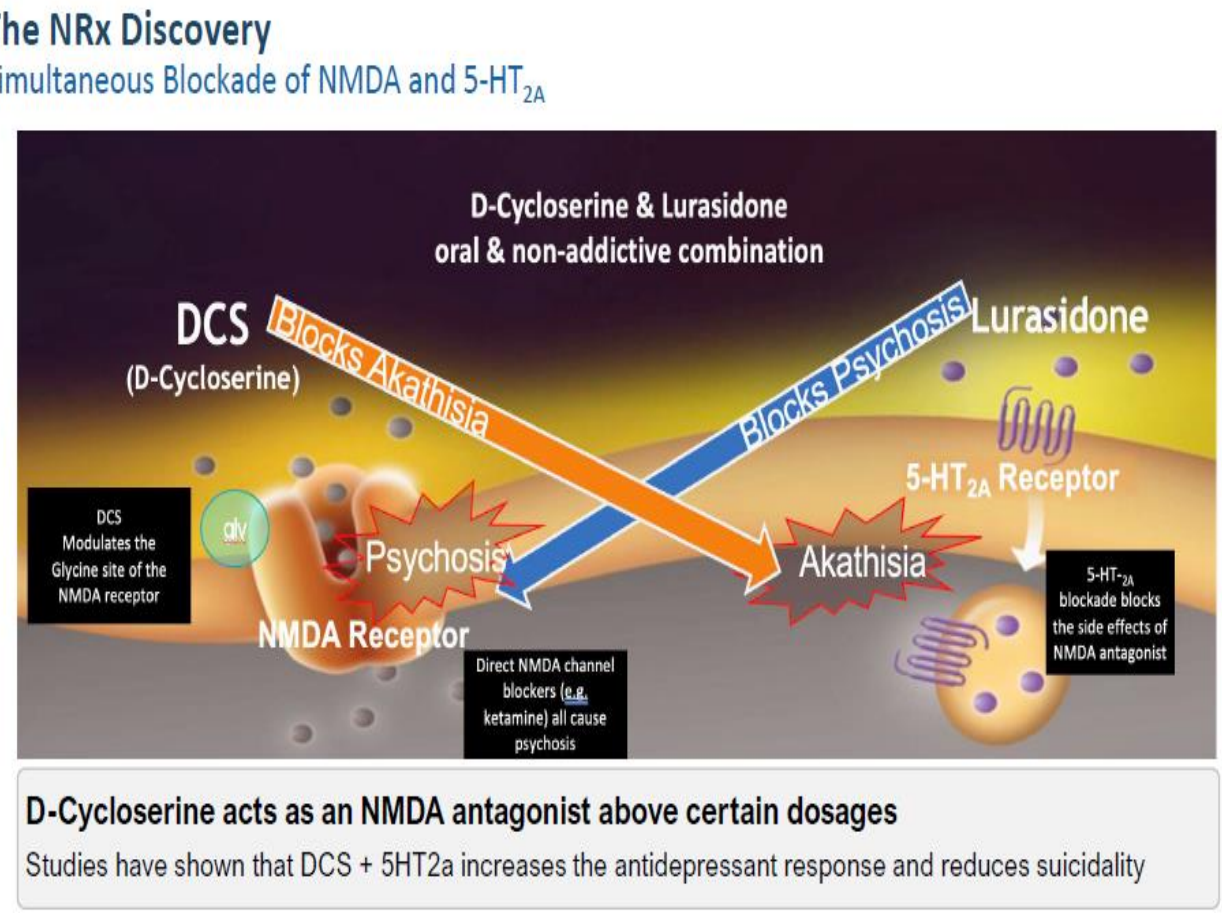
NRx completed (in 2018) a Phase 2 clinical trial of NRX-101 in patients with Severe Bipolar Depression and Acute Suicidal Ideation and Behavior (ASIB) following initial stabilization with a single dose of ketamine (NRX-100) and saw a statistically significant reduction in depression (P=0.04) and suicidal ideation (P=0.02) compared to lurasidone alone over 42 days of treatment. If this statistically-significant advantage is replicated in the Phase 3 clinical trial, under the terms agreed to with the FDA in its Special Protocol Agreement (SPA), NRx aims to submit a NDA to the FDA for NRX-101 in the U.S. in late 2023 or early 2024.

Exhibit 13: Science of Depression and Suicidality



Source: Company reports.

Exhibit 14: NRx Discovery



Source: Company reports.

NRX-100, an IV (intravenous) infusion of ketamine, is taken in conjunction with NRX-101, a fixed-dose combination oral capsule composed of DCS and lurasidone to maintain remission from acute suicidality in acutely depressed bipolar patients. The NRx Sequential Therapy takes advantage of the unique synergistic confluence of three FDA-approved drugs with long histories of safety: DCS, lurasidone, and ketamine.

DCS (Seromycin or Cycloserine) is a broad-spectrum antibiotic approved for the treatment of tuberculosis. DCS has been used in millions of patients and has a well-known safety profile. Its antidepressant effects were first noted as a serendipitous observation in individuals with co-morbid tuberculosis and depression receiving high-dose DCS treatment for anti-tuberculosis therapy. The interaction of DCS with the NMDA receptor was first demonstrated in 1989, leading to some interest in NMDAR blockers as potential antidepressant treatments.

Lurasidone is an atypical antipsychotic with approval for the treatment of depressive episodes associated with bipolar depression in adults and pediatric patients (10-17 years old) as a monotherapy and as an adjunctive therapy with lithium or valproate in adults.

Ketamine has been shown in multiple randomized clinical trials the potential to rapidly reduce depressive symptoms and also suicidal ideation. However, the clinical effect has been demonstrated to diminish three to seven days post-dose when used intravenously and two days post-dose when the S-enantiomer is delivered intranasally. Ketamine is classified as a schedule III substance under the Controlled Substances Act, due to its potential for addiction.

Whereas ketamine is a direct NMDA channel blocker, which binds to the phencyclidine binding site, DCS in high doses has an NMDA-antagonist effect mediated through interaction with the glycine binding site. By combining the potential of DCS to extend the anti-depressant effects of ketamine with the antipsychotic properties of lurasidone, the NRx Pharmaceuticals Sequential Therapy has the potential to stabilize individuals with bipolar depression during acute crisis and address a serious medical need.

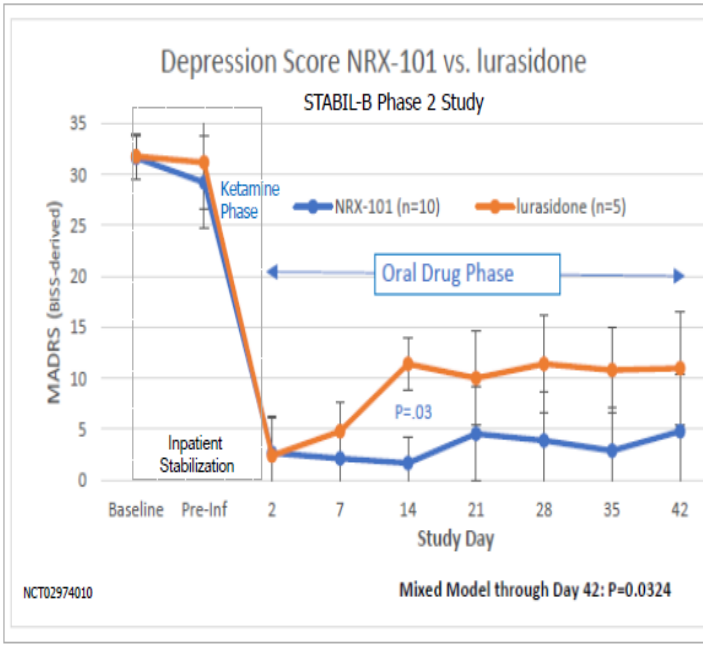
DCS, when combined with Selective Serotonin Reuptake Inhibitor (SSRI) antidepressants in patients with treatment resistant depression, and when combined with atypical antipsychotics, in particular lurasidone, has shown control and ability to maintain remission from suicidality and depression over 6 weeks.

Exhibit 15: Phase 2 Study of D-Cycloserine in Depression / Suicidality Conclusions

Phase 2 Study showed effect of D-Cycloserine in Depression / Suicidality

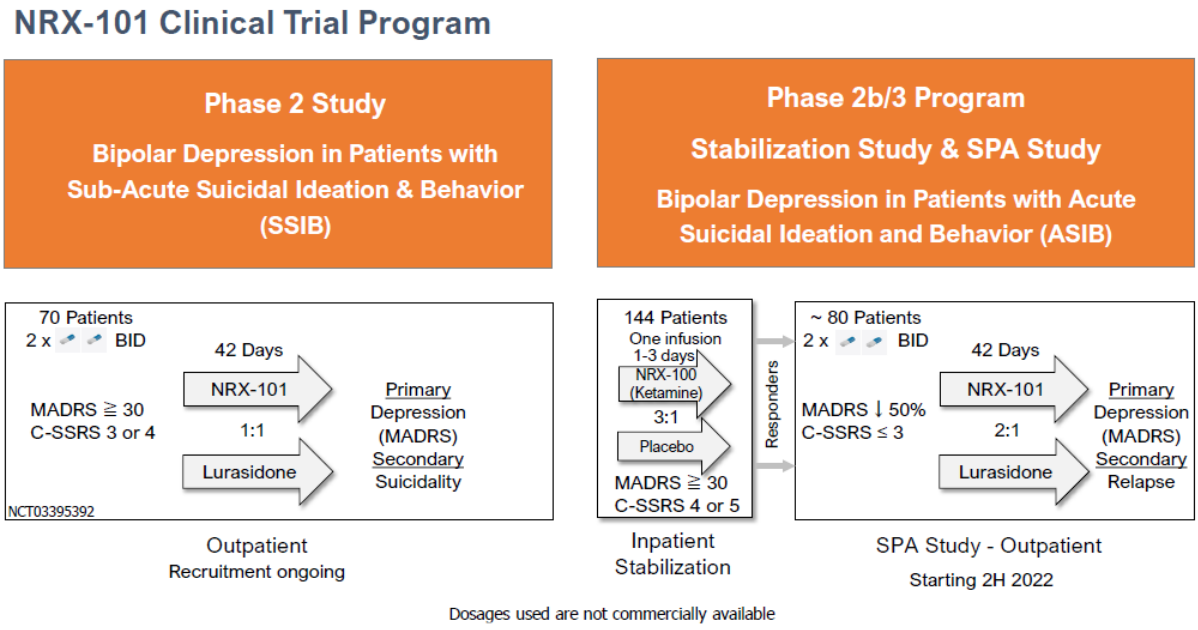
If Phase 2 results are replicated in Phase 3, this will meet criteria for FDA approval

- Primary endpoint is mean MADRS score over 42 days
- A clinically and statistically significant difference (p=.03) was seen on the mixed model through day 42. The mean 7.7 point difference on MADRS is similar to or larger than that seen with Esketamine
- 40% relapse in control group, no relapse in NRX-101 group
- Patients who would otherwise have been in the hospital for 1 week plus were discharged after 1-2 days



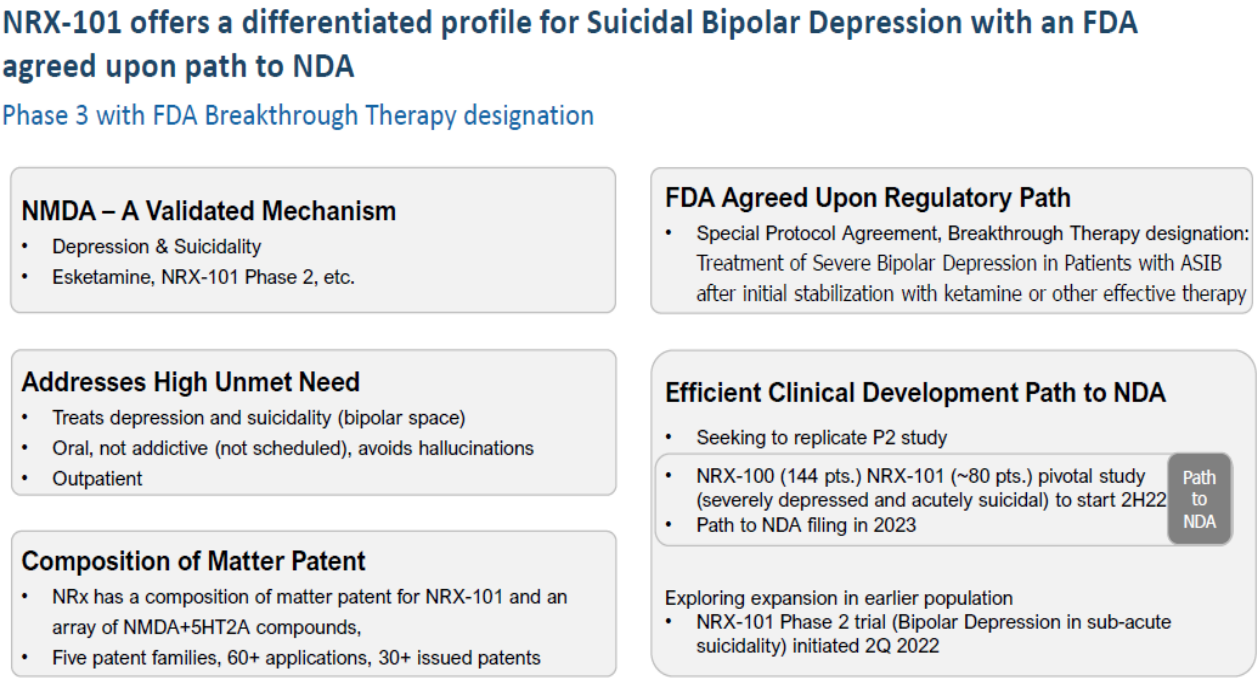
Source: Company reports.

Exhibit 16: Current NRX-101 Clinical Trial Program (SSIB & ASIB)



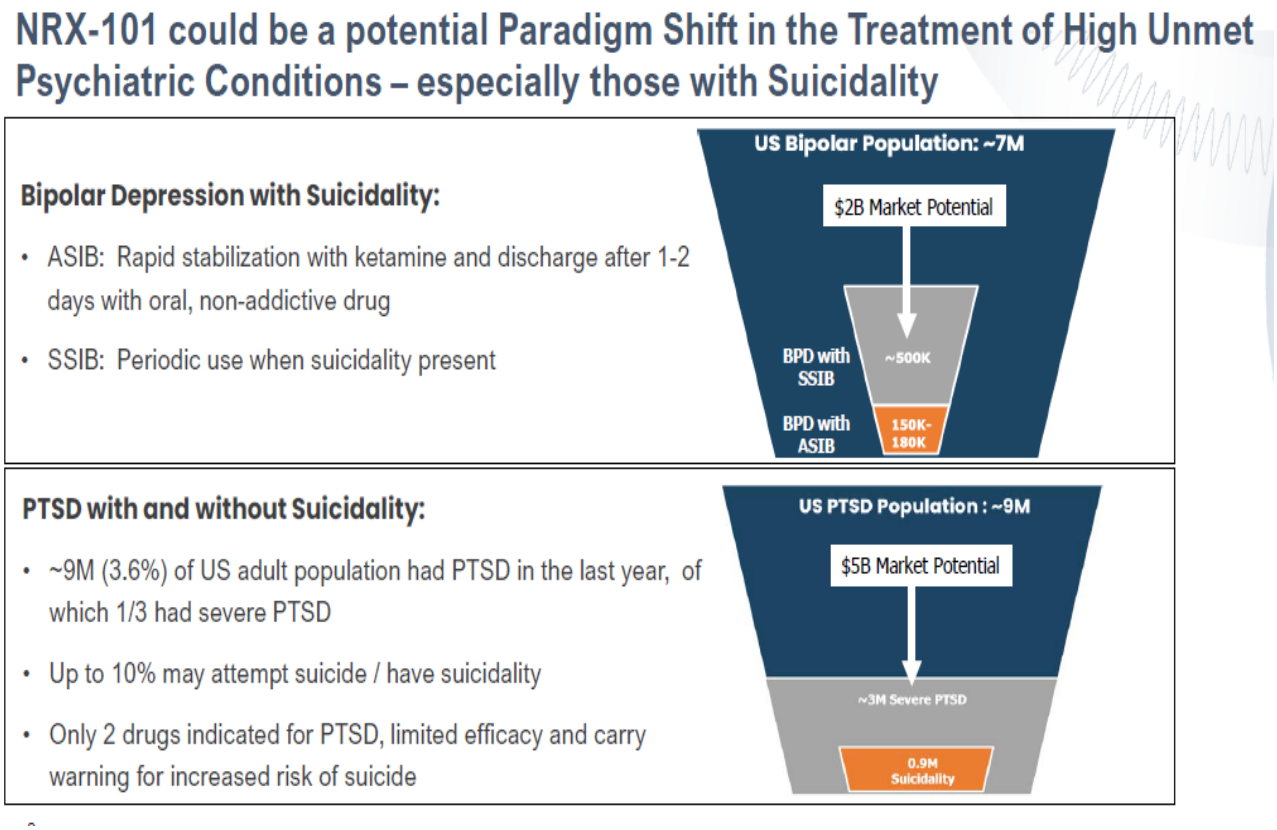
Source: Company reports.

Exhibit 17: NRX-101 Advantages and Objectives



Source: Company reports.

Exhibit 18: NRX-101 Market Opportunities



Source: Company reports.

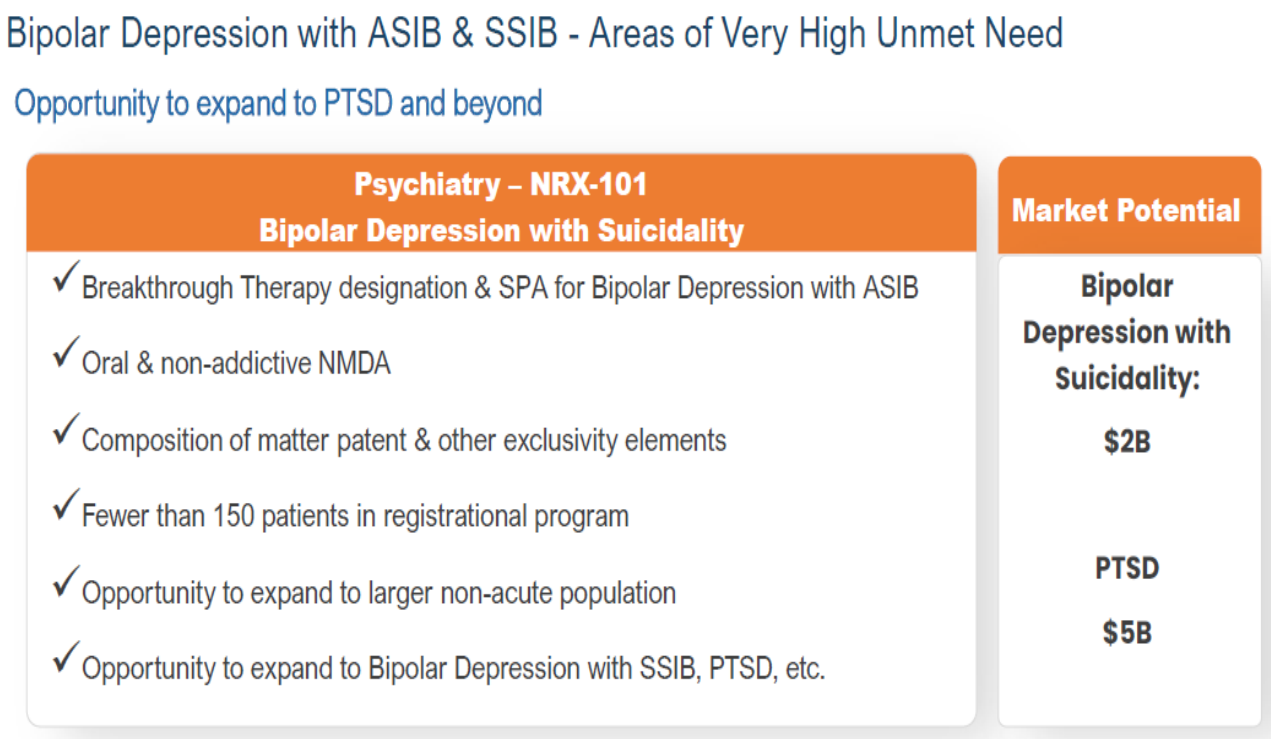
NRx's goal is to offer patients the clinical benefit of rapid reduction in symptoms of depression and suicidal ideation that has been observed with ketamine, while not having ketamine's potential for abuse and psychosis, and required supervised administration. NRX-101 is designed to offer an oral, rapid-onset and sustained home-use therapy that can significantly extend ketamine's proven anti-suicidal and antidepressant benefits without its drawbacks.

NRX-101 potential advantages over competing solutions includes:

- Initial focus on bipolar depression with ASIB and SSIB. Competing pipeline products are focused on MDD and exclude bipolar patients from clinical trials.
- Use of pharmaceutical ingredients for which data indicates no/minimal adverse properties.
- Lack of habituation and addiction. Ketamine is a DEA schedule III controlled substance and is known to be potentially addictive. Preclinical habituation studies show no addiction potential for NRX-101 and there is no reported history of abuse of DCS in more than 60 years of use.
- Hallucinations and vomiting has not been reported or been a concern in NRX-101 clinical studies. Ketamine and its derivatives have been associated with hallucinations and other dissociative side effects. Ketamine must be administered under medical supervision due to possible adverse events such as blood pressure spikes, nausea and vomiting.
- Preclinical studies showed no neurotoxicity. Ketamine and other NMDA blocking drugs have the potential to cause brain cell death when abused/used over extended periods of time.

NRx's long term goal is to expand its psychiatric knowledge and products for the treatment of patients suffering from suicidal ideation to other mental health disorders including major depressive disorder (MDD), post-traumatic stress disorder (PTSD), and obsessive compulsive disorder (OCD). The majority of patients with depression have MDD. Additionally, PTSD is an area of high unmet need for which there are few pharmacological therapeutic treatment options and is also associated with suicidality and depression.

Exhibit 19: NRX-101 Bipolar Depression with ASIB and SSIB Market Potential



Source: Company reports.

FINANCIALS

NRx's fiscal year ends on December 31. We expect its next earnings report (for Q3 2022 ending September) to be in mid-November. Because the company is a clinical stage drug development company, it currently generates no revenue and incurs significant losses as it funds its drug development.

Exhibit 20: NRx Historical and Projected Financials

FYE Dec 31				
(in millions except EPS)	2020A	2021A	2022E	2023E
Total Revenue	0	0	0	0
Operating income (loss)	(51.4)	(115.8)	(43.3)	(34.0)
Net income	(51.8)	(348.9)	(38.7)	(35.2)
EPS	$ (1.51)	$ (7.44)	$ (0.58)	$ (0.49)

Source: Company reports and Ascendiant Capital Markets estimates.

Recent Results (fiscal Q2 ending June 2022)

NRx's recent financial performance is reflective of its developmental stage. In its Q2 2022 report (on August 15, 2022), the company reported no revenue and net loss was $7.0 million. Operating expenses were $10 million, mainly due to drug development costs and general and administrative expenses. Q2 EPS was $(0.11). The major news in Q2 was the ending of its COVID-19 drug development (ZYESAMI) and restarting its psychiatry drug development (NRX-101).

The company does not provide specific quarterly financial guidance, but we believe that R&D expenses should increase as the company expands clinical trial activities. Going forward, we believe operating expenses of ~$9 million is a reasonable near term quarterly burn rate. The company expects continued progress on its drug development milestones in 2022/23. We do not expect the company to experience revenue until its drugs make significant progress towards FDA approval (either from product sales or from the sales of drug marketing rights to new partners), which is likely at least a couple of years away. We have modeled relatively steady operating costs over the next year, primarily driven by its expected main drug (NRX-101) clinical trials expenses.

For 2022, we expect a net loss of $39 million and EPS of $(0.58). For 2023, we expect a net loss of $35 million and EPS of $(0.49).

We believe investors should be focused on its progress on its drug development, which will likely take at least a couple of years before a potential FDA approval. Within the next year, the company plans to complete its current Phase 2 trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidal Ideation & Behavior (SSIB) and to launch two Phase 3 trials for NRX-101 in patients with Bipolar Depression SSIB (not requiring hospitalization) and acute suicidal ideation and behavior (ASIB) (requiring hospitalization) and we should get Top-Line data from these studies.

Exhibit 21: Consensus Expectations (as of November 8, 2022)

	Revenue (mil)	
	2022E	2023E
Q1 Mar	$0A	
Q2 Jun	$0A	
Q3 Sep	$0E	
Q4 Dec	$0E	
Total	$0E	$0E

	EPS	
	2022E	2023E
Q1 Mar	$(0.21)A	
Q2 Jun	$(0.11)A	
Q3 Sep	$(0.14)E	
Q4 Dec	$(0.11)E	
Total	$(0.56)E	$(0.42)E

**Quarterly estimates may not add to annual estimates due to variations in contributing estimates and rounding.*

Source: Company report, Refinitiv, and Ascendiant Capital Markets estimates

Exhibit 22: Q2 2022 and Recent Corporate Highlights (as of August 15, 2022)

Key Business & Clinical Highlights

- Announced new leadership with the appointment of Stephen Willard, JD, as CEO and member of the Board of Directors, and Seth Van Voorhees, PhD, MBA, as CFO
- Repositioned company to focus on psychiatry franchise and our Breakthrough Therapy designated drug NRX-101 for Bipolar Depression in Patients with Suicidality. NRX-101 has additionally been awarded a Special Protocol Agreement by the FDA
- Repatriated manufacture of NRX-101 to a leading North Carolina-based manufacturer, completed technology transfer, and manufactured first batch of phase 3/commercial-ready NRX-101 capsules
- Initiated a Phase 2b trial of NRX-101 in patients with Bipolar Depression and Sub-Acute Suicidality (SSIB); 10 planned clinical sites are activated and are actively enrolling patients, with topline data readout anticipated at the end of Q4 22/Q1 23
- Received independent grading of chest x-rays from a subgroup of patients that survived to day 10 from the intravenous ZYESAMI® Top line analysis shows a statistically significant change between baseline and day 10 on the RALES score (i.e., improvement in ZYESAMI®-treated patients and worsening in placebo-treated patients). Ongoing data analysis is continuing.

Source: Company reports.

We believe that the biggest potential variable in our financial model is the ability of the company to get FDA (or equivalent) approval for its NRX-101 drug under development. It is these approvals that are ultimately how NRx will be able to finally be able to generate revenue. If the company can make significant progress towards these goals, then revenue and earnings will likely be able to grow significantly. However, if the company has difficulties in making progress towards getting drug approvals, then revenue and profitability may not be achieved or will likely grow at a moderate rate or even not at all. Even after drug approvals, NRx faces a big challenge to successfully commercialize its products.

The company's balance sheet has $25 million in cash and no debt as of June 2022. In November 2022, the company just raised $11 million in debt. In February 2022, the company raised ~$25 million (selling 7.8 million shares at ~$3.20 per share). In August 2021, the company raised ~$30 million (selling 2.7 million shares at $11.00 per share). We believe the company has enough cash into Q4 2023, but we believe it will need to raise new capital in mid-2023. The company has guided to having enough cash into Q3 (August) 2023 (not factoring in its recent debt raise).

Exhibit 23: NRx Financial Metrics

Recent Share Price (11/8/22)	$ 0.85
52-Weeks Share Price (Low - High)	$0.49 - 10.39
Shares Outstanding	68 million
Market Capitalization	$58 million
Enterprise Value	$33 million
Cash (6/30/22)	$25 million
Debt (6/30/22)	$0 million
2021A Revenue	$0
2021A Net loss	$349 million
2021A EPS	$ (7.44)
2022E Revenue	$0
2022E Net loss	$39 million
2022E EPS	$ (0.58)
2023E Revenue	$0
2023E Net loss	$35 million
2023E EPS	$ (0.49)

Source: Company reports and Ascendiant Capital Markets estimates.

FINANCIAL MODEL

NRx Pharmaceuticals, Inc.

Income Statement ($ mils)	2020	Mar-21	Jun-21	Sep-21	Dec-21	2021	Mar-22	Jun-22	Sep-22	Dec-22	2022	Mar-23	Jun-23	Sep-23	Dec-23	2023
Fiscal Year End: December 31	FY-A	Q1A	Q2A	Q3A	Q4A	FY-A	Q1A	Q2A	Q3E	Q4E	FY-E	Q1E	Q2E	Q3E	Q4E	FY-E
Total Revenue	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cost of Revenues	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross Profit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Research & development	10.6	2.9	4.7	6.3	6.4	20.3	5.5	3.0	3.5	3.5	15.4	3.5	3.5	3.5	3.5	14.0
General and administrative	11.4	2.1	12.5	13.8	46.6	74.9	10.2	6.6	6.0	5.0	27.9	5.0	5.0	5.0	5.0	20.0
Restructuring and other	29.3	20.6				20.6					0.0					0.0
Total operating expenses	51.4	25.6	17.1	20.1	53.0	115.8	15.7	9.6	9.5	8.5	43.3	8.5	8.5	8.5	8.5	34.0
Operating income (loss)	**(51.4)**	**(25.6)**	**(17.1)**	**(20.1)**	**(53.0)**	**(115.8)**	**(15.7)**	**(9.6)**	**(9.5)**	**(8.5)**	**(43.3)**	**(8.5)**	**(8.5)**	**(8.5)**	**(8.5)**	**(34.0)**
Interest income (expense)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.3)	(0.3)	(0.3)	(0.3)	(1.2)
Other income (expense)	(0.3)	0.1	(238.8)	(0.7)	6.3	(233.1)	2.3	2.6	0.0	(0.3)	4.6	0.0	0.0	0.0	0.0	0.0
Income before income taxes	(51.8)	(25.5)	(255.9)	(20.8)	(46.7)	(348.9)	(13.4)	(7.0)	(9.5)	(8.8)	(38.7)	(8.8)	(8.8)	(8.8)	(8.8)	(35.2)
Income taxes						0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net income (loss)	(51.8)	(25.5)	(255.9)	(20.8)	(46.7)	(348.9)	(13.4)	(7.0)	(9.5)	(8.8)	(38.7)	(8.8)	(8.8)	(8.8)	(8.8)	(35.2)
Nonrecurring/noncash adjustments			(12.5)			0.0					0.0					0.0
Net income (pro forma)	**(51.8)**	**(25.5)**	**(268.4)**	**(20.8)**	**(46.7)**	**(348.9)**	**(13.4)**	**(7.0)**	**(9.5)**	**(8.8)**	**(38.7)**	**(8.8)**	**(8.8)**	**(8.8)**	**(8.8)**	**(35.2)**
EBITDA																
Shares, Basic	34.3	35.7	41.7	51.7	58.5	46.9	63.7	65.7	68.0	69.0	66.6	70.0	71.0	72.0	73.0	71.5
Shares, Diluted	34.3	35.7	42.5	51.7	58.5	46.9	63.7	65.7	68.0	69.0	66.6	70.0	71.0	72.0	73.0	71.5
EPS Basic (pro forma)	**($1.51)**	**($0.71)**	**($6.43)**	**($0.40)**	**($0.80)**	**($7.44)**	**($0.21)**	**($0.11)**	**($0.14)**	**($0.13)**	**($0.58)**	**($0.13)**	**($0.12)**	**($0.12)**	**($0.12)**	**($0.49)**
EPS Diluted (pro forma)	($1.51)	($0.71)	($6.32)	($0.40)	($0.80)	($7.44)	($0.21)	($0.11)	($0.14)	($0.13)	($0.58)	($0.13)	($0.12)	($0.12)	($0.12)	($0.49)
Margins																
Gross margin																
Research & development																
General and administrative																
Operating margin																
Tax rate, GAAP																
Net margin																
Y/Y % change																
Total Revenue																
Gross margin																
Research & development						91%	88%	-37%	-44%	-45%	-24%	-36%	18%	0%	0%	-9%
General and administrative						555%	387%	-47%	-57%	-89%	-63%	-51%	-25%	-17%	0%	-28%
Operating income (loss)						125%	-39%	-44%	-53%	-84%	-63%	-46%	-11%	-11%	0%	-21%
Net income (loss)						574%	-47%	-97%	-54%	-81%	-89%	-35%	26%	-7%	0%	-9%
EPS Diluted (pro forma)						392%	-70%	-98%	-65%	-84%	-92%	-40%	17%	-13%	-5%	-15%

Source: Company reports and Ascendiant Capital Markets estimates.

NRx Pharmaceuticals, Inc.

Balance Sheet ($ mils)	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23
Fiscal Year End: December 31	Q4A	Q1A	Q2A	Q3A	Q4A	Q1A	Q2A	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E
Assets													
Cash and cash equivalents	1.9	13.3	13.4	38.9	27.6	40.2	24.5	16.0	18.2	10.4	9.6	1.8	(1.0)
Short term investments								0.0	0.0	0.0	0.0	0.0	0.0
Account receivable	0.8												
Deferred income taxes								0.0	0.0	0.0	0.0	0.0	0.0
Prepaid expenses and other	0.2	0.3	5.1	6.4	5.1	3.4	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Total current assets	2.9	13.6	18.5	45.2	32.7	43.6	32.4	23.9	26.1	18.3	17.5	9.6	6.8
Property and equipment, net								0.0	0.0	0.0	0.0	0.0	0.0
Intangibles, net								0.0	0.0	0.0	0.0	0.0	0.0
Deferred income tax								0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total assets	**2.9**	**13.6**	**18.5**	**45.3**	**32.7**	**43.6**	**32.4**	**23.9**	**26.1**	**18.3**	**17.5**	**9.7**	**6.9**
Liabilities and stockholders' equity													
Accounts payable	3.2	4.4	6.3	5.6	3.7	4.3	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Accrued expenses	3.3	2.1	2.6	3.2	2.8	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Deferred income tax								0.0	0.0	0.0	0.0	0.0	0.0
Warrant liabilities			0.5	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	39.5	0.0	25.9	26.3	4.6	2.5		0.0	0.0	0.0	0.0	0.0	0.0
Short term debt	0.2	0.2	0.2	0.5	0.5	0.5		0.0	0.0	0.0	0.0	0.0	0.0
Total current liabilities	**46.2**	**6.7**	**35.5**	**36.3**	**11.9**	**11.9**	**7.1**	**7.1**	**7.1**	**7.1**	**7.1**	**7.1**	**7.1**
Deferred income taxes								0.0	0.0	0.0	0.0	0.0	0.0
Warrant liabilities								0.0	0.0	0.0	0.0	0.0	0.0
Other long term liabilities								0.0	0.0	0.0	7.0	7.0	12.0
Long term debt	0.5	0.5	0.5					0.0	10.0	10.0	10.0	10.0	10.0
Total other liabilities	**0.5**	**0.5**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**10.0**	**10.0**	**17.0**	**17.0**	**22.0**
Common stock	0.0	0.0	0.0	0.1	0.1	0.1	0.1	1.1	2.0	3.0	4.0	5.0	6.0
Additional paid-in capital	46.4	122.0	114.2	161.4	204.0	228.3	229.0	229.0	229.0	229.0	229.0	229.0	229.0
Retained earnings	(90.2)	(115.7)	(131.7)	(152.4)	(183.2)	(196.7)	(203.7)	(213.2)	(222.0)	(230.8)	(239.6)	(248.4)	(257.2)
Other								0.0	0.0	0.0	0.0	0.0	0.0
Accumulated other comprehensive income								0.0	0.0	0.0	0.0	0.0	0.0
Total stockholders' equity	**(43.8)**	**6.4**	**(17.4)**	**9.0**	**20.8**	**31.7**	**25.4**	**16.8**	**9.0**	**1.2**	**(6.6)**	**(14.4)**	**(22.2)**
Total stockholders' equity and liabili	**2.9**	**13.6**	**18.5**	**45.3**	**32.7**	**43.6**	**32.4**	**23.9**	**26.1**	**18.3**	**17.5**	**9.7**	**6.9**

Balance Sheet Drivers

	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Dec-23
	Q4A	Q1A	Q2A	Q3A	Q4A	Q1A	Q2A	Q3E	Q4E	Q1E	Q2E	Q3E	Q4E
Book & Cash Value (per share)													
Book Value per Share (diluted)	($1.28)	$0.18	($0.41)	$0.17	$0.36	$0.50	$0.39	$0.25	$0.13	$0.02	($0.09)	($0.20)	($0.30)
Cash per Share (diluted)	$0.05	$0.37	$0.32	$0.75	$0.47	$0.63	$0.37	$0.24	$0.26	$0.15	$0.14	$0.02	($0.01)
Net cash per Share (diluted)	$0.03	$0.35	$0.30	$0.74	$0.46	$0.62	$0.37	$0.24	$0.12	$0.01	($0.01)	($0.11)	($0.15)

Source: Company reports and Ascendiant Capital Markets estimates

NRx Pharmaceuticals, Inc.

Cash Flow Statement ($ mils) Fiscal Year End: December 31	2020 FY-A	Mar-21 Q1A	Jun-21 Q2A	Sep-21 Q3A	Dec-21 Q4A	2021 FY-A	Mar-22 Q1A	Jun-22 Q2A	Sep-22 Q3E	Dec-22 Q4E	2022 FY-E	Mar-23 Q1E	Jun-23 Q2E	Sep-23 Q3E	Dec-23 Q4E	2023 FY-E
Cash flow from operating activities																
Net income	(51.8)	(25.5)	(0.1)	(36.7)	(30.8)	(93.1)	(13.4)	(7.0)	(9.5)	(8.8)	(38.7)	(8.8)	(8.8)	(8.8)	(8.8)	(35.2)
Depreciation	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amortization						0.0					0.0					0.0
Debt related amortization exper	0.1	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)			0.0					0.0
Stock comp	0.7	0.4	9.1	9.5	42.6	61.6	1.3	1.0	1.0	1.0	4.3	1.0	1.0	1.0	1.0	3.9
Deferred income taxes						0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Change in fair value of warrant l	5.4		(17.4)	16.2	(0.5)	(1.7)	(0.2)	(0.1)			(0.3)					0.0
Change in fair value of earnout cash liability			0.4	0.4	(21.7)	(20.9)	(2.1)	(2.5)			(4.6)					
Writedowns and impairments						0.0					0.0					0.0
Other gains/losses	0.3	(0.1)		0.0	(0.0)	(0.1)					0.0					0.0
Other	39.5	21.4		(0.0)	0.0	21.4					0.0					0.0
Changes in operating assets and liabilities:																
Accounts receivable	(0.8)	0.8		0.0	(0.0)	0.8					0.0					0.0
Prepaid expenses & other curre	(0.1)	(0.1)	(4.8)	(1.2)	1.2	(4.8)	1.7	(4.5)			(2.8)					0.0
Income tax						0.0					0.0					0.0
Other assets						0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accounts payable	1.2	1.2	1.3	(0.7)	(1.9)	(0.0)	0.6	(1.2)			(0.6)					0.0
Accrued expenses	3.2	(1.2)	0.1	0.5	(0.3)	(0.9)	1.6	(0.5)			1.2					0.0
Other liabilities						0.0			0.0	0.0	0.0	0.0	7.0	0.0	5.0	12.0
Net cash (used in) provided by	**(2.3)**	**(3.0)**	**(11.4)**	**(12.0)**	**(11.3)**	**(37.7)**	**(10.4)**	**(14.8)**	**(8.5)**	**(7.8)**	**(41.5)**	**(7.8)**	**(0.8)**	**(7.8)**	**(2.8)**	**(19.2)**
Cash flow from investing activities																
Purchases of property and equi	(0.0)		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Purchases of short-term investments						0.0					0.0					0.0
Acquisitions						0.0					0.0					0.0
Other						0.0					0.0					0.0
Net cash used in investing activ	**(0.0)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**
Cash flow from financing activities																
Issuance of debt	0.6					0.0			0.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0
Repayment of debt			(1.1)	(0.2)	0.0	(1.3)		(0.5)			(0.5)					0.0
Issuance of stock	0.1	6.9	1.6	28.5	0.0	37.0	23.0	(0.3)	0.0	0.0	22.6	0.0	0.0	0.0	0.0	0.0
Proceeds from stock option exe	2.6	7.5		9.2	(0.0)	16.7					0.0					0.0
Other			11.1	(0.0)	0.0	11.1					0.0					0.0
Dividends and distributions						0.0					0.0					0.0
Cash provided by (used in) fina	**3.2**	**14.4**	**11.5**	**37.5**	**0.0**	**63.5**	**23.0**	**(0.9)**	**0.0**	**10.0**	**32.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Effect of exchange rate on cash						0.0					0.0					0.0
Net increase (decrease) in cash	**1.0**	**11.4**	**0.1**	**25.5**	**(11.3)**	**25.7**	**12.6**	**(15.7)**	**(8.5)**	**2.2**	**(9.4)**	**(7.8)**	**(0.8)**	**(7.8)**	**(2.8)**	**(19.3)**
Beginning cash and equivalents	**0.9**	**1.9**	**13.3**	**13.4**	**38.9**	**1.9**	**27.6**	**40.2**	**24.5**	**16.0**	**27.6**	**18.2**	**10.4**	**9.6**	**1.8**	**18.2**
Ending cash and equivalents	**1.9**	**13.3**	**13.4**	**38.9**	**27.6**	**27.6**	**40.2**	**24.5**	**16.0**	**18.2**	**18.2**	**10.4**	**9.6**	**1.8**	**(1.0)**	**(1.0)**

Source: Company reports and Ascendiant Capital Markets estimates

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NRx Pharmaceuticals, Inc.

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Total return is defined as price appreciation plus dividend yield.

Ascendiant Capital Markets, LLC Rating System

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Total return is defined as price appreciation plus dividend yield.

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			Investment Banking Services Past 12 months	
Rating	**Count**	**Percent**	**Count**	**Percent**
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Sell	1	2%	0	0%
Total	44	100%	17	39%

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