William Blair

Vital Therapies, Inc.

May 29, 2014

First-Quarter Financials Non-event; VTI-208 on Track for First Half 2015 Readout; Enrollment in VTI-210 Study Next

On Wednesday, May 28, after markets closed, Vital Therapies reported first-quarter financial results (exhibit 1). The company ended the first quarter with $46.0 million in cash and cash equivalents. Adding net proceeds of $52.4 million from the IPO and full exercise of overallotment completed during the second quarter, we estimate that current cash should sustain operations through the data release of the Phase III VTI-208 study expected during first half 2015 and into first half 2016. Net loss for the quarter was $13.8 million with a per-share loss of $24.49, versus our estimates of $9.4 million and $0.57, respectively; the discrepancy in loss per share is attributed to our estimate for weighted-average number of shares of 16.6 million for the quarter, compared to the 564,200 shares reported by the company. We updated our model as illustrated in exhibit 1.

ELAD system clinical development program update: Enrollment of the Phase III VTI-208 study is on-track, while first patient enrollment in the Phase III VTI-210 study is expected any time. The company continues to anticipate initiation of the Phase II/III VTI-212 study in second half 2014. The extracorporeal liver-assist device (ELAD) system clinical development program covers several major subgroups of Acute Liver Failure (ALF) and Acute-on-Chronic Liver Failure (ACLF) with survival as the primary endpoint. We illustrate the ELAD system development timeline in exhibit 3.

- ***The first Phase III study, VTI-208, is a randomized, open-label, multicenter, controlled study investigating the effects of ELAD in combination with standard therapy of the study site versus standard therapy alone in patients with alcohol-induced liver decompensation (AILD).*** The primary endpoint is overall survival at 90 days; secondary endpoints of the study include overall survival at 28 days and model for end-stage liver disease (MELD)-based time to progression. Long-term effects of ELAD will also be reported, as subjects will be followed for an additional five years in an extension study. The VTI-208 study is designed with 95% power to achieve statistical significance for the primary endpoint of overall survival. As of May 27, 111 of the 200 expected patients have been enrolled into the VTI-208 study. Management continues to expect top-line data from the study by first half 2015. VTI-208 is primarily conducted in the United States.

Vital Therapies, Inc. is a hybrid biopharmaceutical–medical technology company based in San Diego, California, focused on the development of its ELAD technology system as a treatment for patients with acute liver failure.

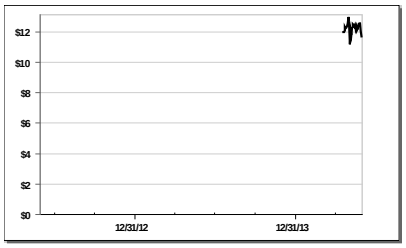
Stock Rating:	**Outperform**
Company Profile:	**Aggressive Growth**
Price Target:	$28.00
Symbol:	VTL (NASDAQ)
Price:	$12.03 (52-Wk.: $11-$13)
Market Value (mil.):	$247
Fiscal Year End:	December
Long-Term EPS Growth Rate:	
Dividend/Yield:	None

		2013A	2014E	2015E
Estimates				
EPS	Q1	NA	A$-24.49	NA
	Q2	NA	$-0.58	NA
	Q3	NA	$-0.55	NA
	Q4	NA	$-0.56	NA
	FY	$-74.86	$-3.08	$-2.27
	CY		$-3.08	$-2.27
Sales (mil.)		0	0	0
Valuation				
FY P/E		NM	NM	NM
CY P/E			NM	NM

Trading Data (FactSet)	
Shares Outstanding (mil.)	12
Float (mil.)	10
Average Daily Volume	86,080

Financial Data (FactSet)	
Long-Term Debt/Total Capital (MRQ)	0.0
Book Value Per Share (MRQ)	2.9
Return on Equity (TTM)	-45.0

Two-Year Price Performance Chart



Sources: FactSet, William Blair & Company estimates

Y. Katherine Xu, Ph.D.
+1 212 237 2758
kxu@williamblair.com

Filippo Petti
+1 212 237 2741
fpetti@williamblair.com

- ***The second Phase III study, VTI-210, is a randomized, open-label, multicenter, controlled study investigating the effects of ELAD in combination with standard therapy of the study site versus standard therapy alone in AAH patients, a subset of AILD.*** Initiated in April 2014, the study will enroll 120 acute alcoholic hepatitis (AAH) patients who have failed at least seven days but no more than nine days of steroid therapy, according to predefined criteria; management noted that four sites are currently open for enrollment. The primary endpoint of the study is overall survival at 90 days; the secondary objective of the study is survival at 28 days. Similar to the VTI-208 study, the VTI-210 study is designed with 95% power to achieve statistical significance for the primary endpoint of overall survival. We anticipate completion of enrollment by mid-2015 and top-line data by late 2015 or early 2016. VTI-210 is primarily conducted in Europe, where steroid use in AAH patients is considered frontline therapy.

- ***Planned Phase II/III VTI-212 study in patients with FHF or SILF to start by year-end 2014.*** Vital Therapies also plans to initiate the Phase II single-arm portion of the study, enrolling 40 patients with fulminant hepatic failure (FHF) or surgery-induced liver failure (SILF) by year-end 2014. The planned primary endpoint of the Phase II component of the study is 28-day survival, which will be compared with historical or matched controls. We anticipate top-line data from the Phase II portion of the study by late 2015 or early 2016. Results from the Phase II portion of the study might be sufficient for an expedited regulatory approval pathway; however, in the event a Phase III study is necessary for the indication, the study design would be finalized based on analysis of the Phase II component.

- ***Background on ELAD.*** The ELAD System is the first human-cell-based bioartificial liver (BAL) therapy to be evaluated in Phase III clinical development for the treatment of ALF. ELAD is an allogeneic cellular therapy system in which human-liver-derived cells, known as C3A cells, contained in a single-use disposable set of four hollow fiber cartridges, are incorporated into a reusable, customized heart-lung machine—a device typically used in open-heart surgery to support the body during the surgical procedure. The heart-lung machine provides extracorporeal circulation of the patient's blood plasma to the cartridges containing the C3A cells for a two-way exchange of toxins, metabolites, and nutrients, and then returns the plasma to the patient. The ELAD system is specifically designed to simulate liver function while the patient's liver is given an opportunity to recover its regenerative properties.

We believe a number of catalysts will drive value in Vital Therapies stock over the next 12-24 months, including: 1) top-line data from the Phase III VTI-208 study in AILD patients expected in first half 2015; 2) potential submission of the ELAD system biological license application (BLA) to the FDA by year-end 2015; 3) top-line data from the Phase III VTI-210 study in AAH in late 2015 or early 2016; 4) top-line data from the Phase II component of the VTI-212 study in FHF and SILF in late 2015 or early 2016; and 5) potential FDA approval and U.S. commercial launch of the ELAD system in second half 2016.

We maintain our Outperform rating and $28 price target (exhibit 2). Our Outperform rating is based on our belief that the ELAD system will become the standard of care for the treatment of ALF in both the United States and Europe, and could generate peak worldwide sales of $1.3 billion by 2032. Our probability adjusted NPV model assumes a 70% probability of success for the ELAD system development program, and suggests a fair value for the ELAD system of $26 at year-end 2014, with $16 attributed to the United States and $10 to Europe. Adding $2 of cash at year-end 2014, we derive our price target at $28.

Potential sources of upside to our revenue estimates include: 1) pricing for ELAD therapy. The cost associated with a liver transplant is estimated to be more than $500,000. If ELAD can not only save but also prolong the lives of patients by decades who are either ineligible for transplant or waitlisted for transplant, the value proposition for ELAD therapy would be strong, in our opinion; 2) expansion from AAH to full AILD patient population in Europe could lead to an additional $300 million in peak sales on the continent; and 3) sales outside the United States and Europe are further upside.

While evidence to date supports ELAD being a promising treatment for various forms of ALF, we assign the ELAD Phase III program a 70% probability of success based on the following arguments and rationales:

1. ***Survival trends were demonstrated from three Phase II studies.*** It is encouraging that three randomized, controlled Phase II studies conducted in the United States, Europe, and China have demonstrated survival trends in favor of ELAD, and that one of the three studies reached statistical significance. The studies informed powering and design for the current Phase III studies, and also informed patient selection criteria for the Phase III program.

2. ***However, each of the three Phase II studies has its caveats.*** First, VTI-206, a randomized, controlled Phase IIb study in AILD and non-AILD subjects, was stopped early due to a lack of benefit in the non-AILD cohort. Upon termination of the study, per protocol an analysis of the AILD cohort was performed and demonstrated a survival trend. This study

informed that ELAD is not effective in non-AILD patients whose livers are not readily regenerable. Second, in the FHF studies, only a post hoc meta-analysis in a subset of patients who were listed for transplant suggested a survival benefit. Lastly, VTIC-301, the Chinese study in subjects with acute flare hepatitis, was halted early due to observed efficacy in subjects. But a protocol amendment led to further enrollment of patients with less severe disease. Analyses on the two different populations led to different sets of data, and consistent statistical significance was only observed among the first 49 enrolled patients. Overall, each of the aforementioned studies and their data analyses had various degrees of limitations. Nonetheless, the signals observed warrant well-designed and well-executed Phase III studies.

3. ***Biomarker data from Phase II studies, including improvement in bilirubin, serum sodium, and creatinine, are all pointing in the right direction.*** Bilirubin is a byproduct of hemoglobin degradation, which can accumulate and result in jaundice if it is not properly cleared and excreted by the liver. In previous Phase II studies, ELAD-treated subjects demonstrated a significant reduction in serum bilirubin levels over the five days of therapy as compared with the standard of care, indicating that the ELAD system was able to carry out the functions of a liver. Further, serum creatinine, a biomarker of kidney function, was reduced in the first six days, while the control did not reduce serum creatinine. Lastly, sodium, an electrolyte that typically decreases with acute liver failure, increased in ELAD-treated subjects over the first six days as compared with the control. Taken as a whole, these biomarkers suggest an improvement in liver function in ELAD-treated subjects.

4. ***Proper patient selection is critical for success of the Phase III program: expected mortality rate of 50% and liver is regenerable.*** The key to the success of the Phase III program is to enroll patients with an expected mortality rate of around 50% and also with regenerable livers, so that ELAD can make the strongest difference in improving survival. Specifically, we point to a few of the screening criteria. Patients enrolled are required to have a MELD score of 18-35, which would include patients who are neither too healthy nor too sick; a MELD score in the mid-20s predicts 40% mortality rate. They must also have a Maddrey discrimination function test score greater than 32; this test is a predictor of disease severity and mortality and a score greater than 32 predicts probability of death of 40%-50% by 90 days. In addition, patients with cirrhotic livers are excluded, as such livers are not regenerable and ELAD would not make a difference. Further, patients who are rapidly improving or deteriorating too quickly on admission are also excluded.

5. ***Statistical powering of Phase III program is high.*** The Phase III statistical plans for VTI-208 and VTI-210 are conservative based on the results from the Phase II VTI-206. Both ongoing Phase III studies are designed with 95% power to achieve statistical significance for the primary endpoint of overall survival. In other words, the studies are 95% powered to reach a p-value of 0.05 assuming 90-day survival for the control arm to be around 50% and for the ELAD arm to be 75%, with a median survival of 45 days for the control arm and 90 days for the ELAD arm.

6. ***There are a number of confounding factors due to the open-label design; a standard patient follow-up protocol has been devised to minimize potential imbalances.*** There is concern regarding the ELAD Phase III programs that ELAD-treated patients would be biased to have better care and attention compared with the control group. To minimize such potential bias, a detailed patient follow-up protocol is incorporated into the Phase III studies.

7. ***The encouraging survival trend observed with Circe Biomedical's HepatAssist bodes well for ELAD, in our opinion.*** The design of the porcine-cell-based BAL HepatAssist system, previously developed by Circe Biomedical, looks to be inferior to the ELAD system in terms of: 1) the number of cells supplied (ELAD system uses 11 times more cells than HepatAssist); 2) the duration of treatment; ELAD can be connected to ALF patients 24/7 and the four cartridges can continue to function for up to 17 days without the need for replacement, whereas one HepatAssist cartridge can only be used for six to eight hours per day and a fresh cartridge is needed every day, likely not enough treatment time for the liver to regenerate; and 3) high immunological risks (porcine [pig] versus human cells). Despite all these shortcomings, HepatAssist demonstrated a survival trend in a Phase II/III study in ALF patients. In fact, a subset analysis of the study demonstrated borderline statistical significance in 30-day survival. We are encouraged by such data and believe such data might bode well for ELAD, which appears to exceed the HepatAssist system in supplementing liver function in almost every aspect.

Key risks to our Outperform rating and price target include: 1) clinical risk of the Phase III program, which was based on trends observed in previous Phase II studies; 2) regulatory risk given the FDA's concern that the Phase III VTI-208 and VTI-210 studies are open label and not blinded; 3) regulatory risk associated with a drug/device combination requiring approval from FDA's Center for Biologics Evaluation and Research and Center for Devices and Radiological Health; 4) reimbursement risk provided that the process might be long and arduous; 5) commercialization risk if the ALF market is smaller than

expected and/or difficult to penetrate; 6) manufacturing risks associated with Vital Therapies' proprietary C3A cells and cartridges; and 7) technical risk, considering that the ELAD system comprises a hybrid biologic and medical device and that a number of components of the medical device are outsourced by third parties.

Exhibit 1
Vital Therapies, Inc.
Income Statement
(dollars in thousands)

	2012A	2013A	2014					2015E	2016E
			Q1A	Q2E	Q3E	Q4E	FY:14E		
Revenues									
ELAD US revenues	$0	$0	$0	$0	$0	$0	$0	$0	$4,829
ELAD OUS revenues	-	-	-	-	-	-	-	-	-
Collaboration and licensing revenue	-	-	-	-	-	-	-	-	-
Total Revenues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4,829**
Expenses									
COGS	-	-	-	-	-	-	-	-	966
R&D expense	5,097	21,787	9,219	9,311	9,404	9,498	37,433	38,656	39,133
SG&A expense	4,483	9,615	2,657	2,684	2,710	2,738	10,788	11,227	21,524
Total Operating Expenses	9,580	31,402	11,876	11,995	12,115	12,236	48,221	49,883	61,623
Operating income	(9,580)	(31,402)	(11,876)	(11,995)	(12,115)	(12,236)	(48,221)	(49,883)	(56,794)
Interest income	4	5	-	5	9	8	22	20	(3)
Interest expense, net	(413)	-	-	-	-	-	-	-	-
Other (expense) income, net	7	(15)	-	-	-	-	-	-	-
Revaluation of preferred stock warrant liabilities	180	-	-	-	-	-	-	-	-
Revaluation of future purchase rights liabilities	3,101	(1,306)	1,128	-	-	-	1,128	-	-
Total other Income (expense)	(6,701)	(32,718)	(10,748)	(11,990)	(12,106)	(12,228)	(47,072)	(49,863)	(56,797)
Pretax income/(loss)	(6,701)	(32,718)	(10,748)	(11,990)	(12,106)	(12,228)	(47,072)	(49,863)	(56,797)
Other comprehensive gain/(loss)	-	(64)	-	-	-	-	-	-	-
Accretion to redemption value of redeemable convertible preferred stock	(942)	(6,303)	(3,070)	-	-	-	(3,070)	-	-
Provision for income taxes/(income)	-	-	-	-	-	-	-	-	-
Tax rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income/(Loss)	**(7,643)**	**(39,085)**	**(13,818)**	**(11,990)**	**(12,106)**	**(12,228)**	**(50,142)**	**(49,863)**	**(56,797)**
GAAP EPS	**($17.89)**	**($74.86)**	**($24.49)**	**($0.58)**	**($0.55)**	**($0.56)**	**($3.08)**	**($2.27)**	**($2.57)**
Weighted average shares outstanding, diluted	427	522	564	20,800	21,825	21,850	16,260	21,925	22,070

Sources: Vital Therapies, Inc., and William Blair & Company, L.L.C. estimates

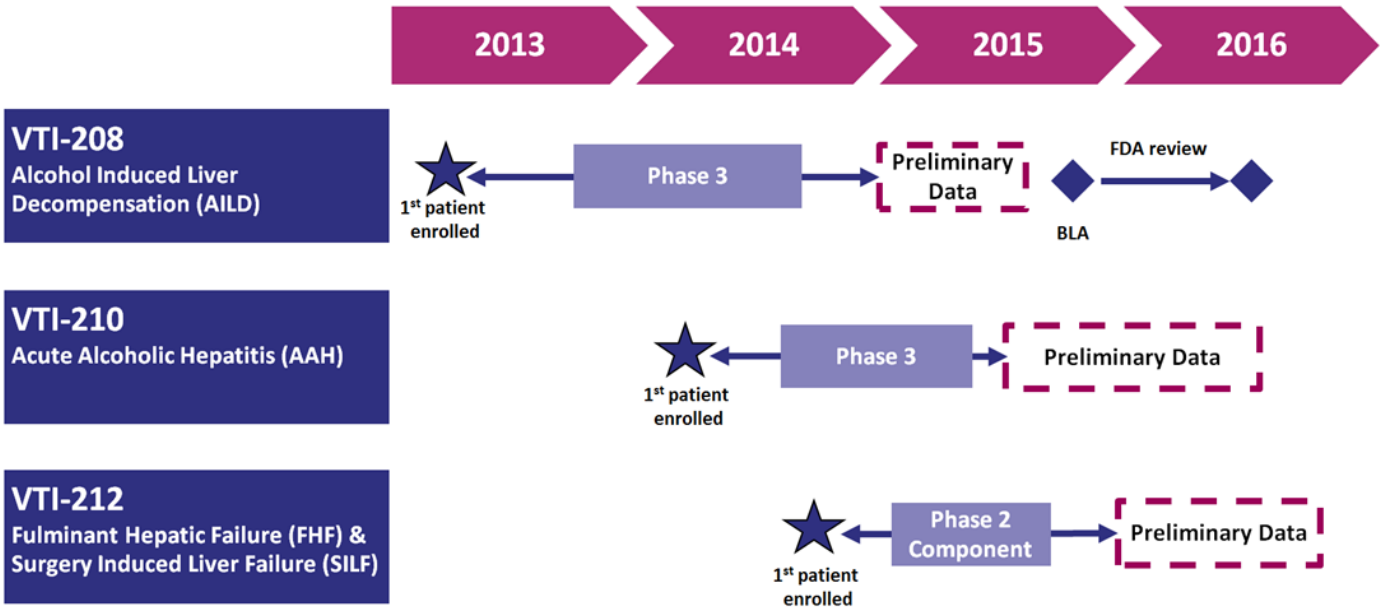
Exhibit 2
Vital Therapies, Inc.
Sum-of-the-Parts Fair Value
(dollars in thousands, except shares)

Drug Candidate	Peak Sales	Stage of Development	Estimated Launch Date	Probability of Commercialization	Percentage of Sales to Company	Probability-Adjusted NPV	Value per Share	Percentage of Fair Value
ELAD system—United States	$803,481	Phase III	H2:2016	70%	100%	$340,573	$15.59	54.7%
ELAD system—European Union	$522,530	Phase III	H1:2017	70%	100%	$232,990	$10.66	37.4%
Subtotal						**$573,563**	**$26.25**	**92.2%**
Net Cash at Year-end 2014 **Net Present Value of additional Gain (Loss)***						$66,555 ($17,857)	$3.05 ($0.82)	10.7% (2.9%)
Sum-of-Parts Fair Value						**$622,261**	**$28.48**	**100.0%**

* Includes costs not directly related to programs above

Sources: Vital Therapies, Inc., and William Blair & Company, L.L.C. estimates

Exhibit 3
Vital Therapies, Inc.
Clinical and Regulatory Timelines for ELAD System



Source: Vital Therapies, Inc.

IMPORTANT DISCLOSURES

William Blair was a manager or co-manager of a public offering of equity securities for Vital Therapies, Inc. within the prior 12 months.

William Blair is a market maker in the security of Vital Therapies, Inc. and may have a long or short position.

William Blair intends to seek investment banking compensation in the next three months from Vital Therapies, Inc.

Within the past 12 months William Blair has provided or is providing investment banking services to or has an investment services relationship with Vital Therapies, Inc.

Additional information is available upon request.

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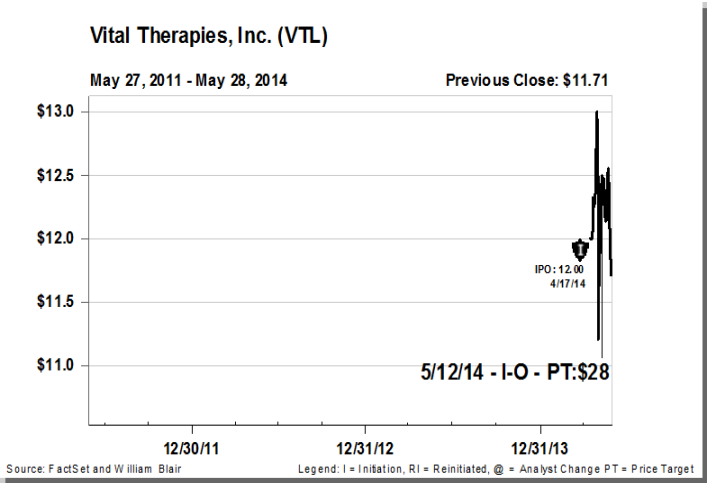
DOW JONES: 16,633.18
S&P 500: 1,909.78
NASDAQ: 4,225.07



Current Rating Distribution (as of 04/30/14)

Coverage Universe	Percent	Inv. Banking Relationships*	Percent
Outperform (Buy)	66	Outperform (Buy)	14
Market Perform (Hold)	31	Market Perform (Hold)	2
Underperform (Sell)	1	Underperform (Sell)	0

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