ARROWHEAD PHARMACEUTICALS

Fiscal 2018 Second Quarter Conference Call – Prepared Remarks

May 8, 2018

1:30 PM Pacific time

Operator

Ladies and gentlemen welcome to the Arrowhead Pharmaceuticals conference call. Throughout today's recorded presentation all participants will be in a listen-only mode. After the presentation, there will be an opportunity to ask questions. I will now hand the conference call over to Vincent Anzalone, Vice President of Investor Relations for Arrowhead. Please go ahead Vince.

Vince Anzalone

Good afternoon everyone. Thank you for joining us today to discuss Arrowhead's results for its fiscal 2018 second quarter ended March 31, 2018. With us today from management are president and CEO Dr. Christopher Anzalone, who will provide an overview of the quarter; Dr. Bruce Given, our chief operating officer and head of R&D, who will discuss our clinical programs; and Ken Myszkowski, our chief financial officer, who will give a review of the financials. We will then open up the call to your questions.

Before we begin, I would like to remind you that comments made during today's call contain certain forward-looking statements within the meaning of Section 27(A) of the Securities Act of 1933 and Section 21(E) of the Securities Exchange Act of 1934. All statements other than statements of historical fact, including

without limitation those with respect to Arrowhead's goals, plans, and strategies are forward-looking statements. These include statements regarding our expectations around the development, safety and efficacy of our drug candidates, projected cash runway, and expected future development activities. These statements represent management's current expectations and are inherently uncertain. Thus, actual results may differ materially. Arrowhead disclaims any intent and undertakes no duty to update any of the forward-looking statements discussed on today's call.

You should refer to the discussions under risk factors in Arrowhead's annual report on Form 10-K and the Company's subsequent quarterly reports on Form 10-Q for additional matters to be considered in this regard, including risks and other considerations that could cause actual results to vary from the presently expected results expressed in today's call.

With that said, I'd like to turn the call over to Christopher Anzalone, President and CEO of the Company. Chris?

Chris Anzalone

Thanks Vince. Good afternoon everyone and thank you for joining us today.

We see drug development as an innovation and application interplay. It requires raw scientific innovation first (both at the level of understanding disease biology and potential interventional strategies), and then application of that innovation in humans. This is not necessarily a simple 1-2 process whereby further innovation is made unnecessary after successful application in humans. Rather, human application often drives further innovation. We stand today on the shoulders of all

the innovation and application work we have done to date. This represents a huge amount of important science spanning multiple classes of technologies, countless pre-clinical studies, and three prior clinical programs. This has all led to the TRiM™ platform and our approach to and understanding of several disease indications.

I lay this out because we view 2018 as a pivotal year in the application of Arrowhead innovation. We are operating at a very high level and have already brought two candidates, ARO-AAT and ARO-HBV, into the clinic, and we are on pace to advance three additional candidates to CTA filings by the end calendar 2018. We expect to generate data throughout the year that could provide clinical validation and decrease the risk profile of the platform, drug candidates, and ultimately our company. Think of these in 4 general categories:

1. Safety of the platform and candidates;
2. Scalability of the platform;
3. Partnerability of the platform; and
4. Clinical relevance of the candidates.

Chipping away at these unknowns drives value for us, and we made clear progress in all of them last quarter and the period since our last conference call.

Let's look at each of these and begin with the most important: safety of the platform and candidates. ARO-AAT and ARO-HBV both started dosing in March. ARO-AAT, which was recently granted orphan drug designation by the FDA, is our second generation subcutaneously administered candidate for the treatment of alpha-1 antitrypsin deficiency liver disease. ARO-HBV is our third generation

subcutaneously administered clinical candidate for the treatment of chronic hepatitis B virus infection.

Both first-in-human studies are designed to include a single-ascending dose phase and a multiple-ascending dose phase that are essentially running in parallel. Bruce will talk more about the studies in a moment, but the phase 1/2 design is intended to rapidly get to meaningful readouts on safety and tolerability as well as single- and multiple-dose activity. We have now treated 38 subjects, 24 on active drug and 14 with placebo, between the two programs and both candidates have been well tolerated thus far. Of course the studies are still young and several additional dose levels remain to be tested, but it is encouraging to see a favorable safety profile to date.

Lets now turn to scalability of the platform. We made substantial progress since our last conference call demonstrating that there is much we can do with the TRiM™ platform. Just last week we announced two upcoming presentations that will cover TRiM™ enabled liver-targeted candidates and our extra-hepatic capabilities.

ARO-APOC3 and ARO-ANG3 are our most advanced wholly-owned preclinical candidates. They are targeting apolipoprotein C-III, or apoC-III, and angiopoietin-like protein 3, or ANGPTL3, respectively. They are designed to address multiple cardiometabolic diseases and may offer various development paths targeting both mass market and/or orphan indications.

We haven't disclosed much about those programs, other than some early rodent data that we discussed at our analyst day last year. Bruce Given, our COO, will

present additional preclinical data for both programs at the Vascular Discovery: From Genes to Medicine Symposium at an American Heart Association organized conference later this week. These candidates are moving ahead according to plan and we continue to be excited about the opportunities that they represent. We are on schedule to file CTAs for both candidates before the end of the year.

The second presentation that we announced is for ARO-ENaC, formerly referred to as ARO-Lung1, which is the first candidate to leverage the TRiM™ platform to address diseases in the lung. We will present data on this at the American Thoracic Society 2018 International Conference on May 21st.

ARO-ENaC is an inhaled RNAi therapeutic targeting the epithelial sodium channel alpha subunit, or alpha ENaC, for the treatment of cystic fibrosis, or CF. CF is a rare disease caused by a genetic mutation that leads to mucus buildup in the lungs and pancreas. In CF lung disease, patients can have difficulty breathing and experience frequent and persistent lung infections. Increased ENaC activity contributes to drying mucus in the airway and a reduced ability of the lung to clear toxins and infectious agents. Interestingly, inheritance of poorly functioning ENaC genes by CF patients leads to milder lung disease. Therefore, researchers have been interested in decreasing ENaC activity in CF patients if possible. However, the development of inhaled small molecule inhibitors has been limited by their short duration of action and worrisome side effects resulting from ENaC inhibition in the kidney.

We think ENaC has good validation as a target and our goal is to selectively reduce it in the lung while sparing the kidney. RNAi broadly and the TRiM™ platform specifically seem tailor made for this function when the aim is targeted activity

against a single gene, long duration of effect, and high tissue specificity. We believe we can do all of those.

The presentation later this month will be our first on the TRiM™ pulmonary platform and the ENaC program. We have submitted, and plan to submit, ARO-ENAC abstracts to additional medical and scientific meetings later this year. In addition, our plan is to hold an analyst day this summer to discuss the lung program and ARO-ENaC in more detail. We have not yet scheduled that event, but we will announce it when we have set the date.

Our expanded capabilities also present the good problem that we, or any company for that matter, will not have the resources to pursue every opportunity and extract all value from the TRiM™ platform by ourselves. It clearly makes sense to enter into a limited number of strategic partnerships, so the partnerability of the platform is a value driver for us. Our collaboration with Amgen continues to progress well. That deal covers two cardiovascular targets. One against lipoprotein(a), which is now referred to as AMG 890. The second, which we call ARO-AMG1, is against an undisclosed target. Both are wholly licensed to Amgen. We feel confident that we will do additional partnerships with other companies in the future.

Lets now turn to the most important value driving category: clinical relevance of the candidates. During the quarter we presented clinical data at EASL from ARC-520, a prior generation compound for HBV. I want to highlight some of those data because they represent what we see as a very encouraging proof-of-concept for the use of an RNAi compound in HBV, and, therefore, are relevant to our ARO-HBV program.

The poster presentation included follow-up data for patients enrolled in the Heparc-2001 multi-dose extension study. In the study, 8 chronic hepatitis patients (5 e-antigen negative, and 3 e-antigen positive) received up to 9 doses of 4 mg/kg ARC-520 once every 4 weeks with daily entecavir. Viral DNA, RNA, and antigen knockdown were measured at regular intervals. Patients were monitored for an additional 12 months following the last ARC-520 dose.

Key results include the following:

- Multiple doses of ARC-520 resulted in s-antigen reductions in all patients by as much as 5.3 Logs. Where measurable, multi-log reductions were also seen in e antigen, core related antigen, DNA and HBV RNA.
- We were pleased to announce that one e-antigen negative patient, while remaining on entecavir, serocleared for all measurable viral markers including s-antigen, core-related antigen, HBV RNA, and HBV DNA. We believe this will represent a functional cure.
- 2 out of 3 e-antigen positive and 2 out of 5 e-antigen negative patients, or half of the patients in the study, achieved productive and sustained host responses. These were characterized by mild-ALT elevations coinciding with continued reductions in various viral markers which persisted after ARC-520 therapy was removed.
- Two patients that experienced sustained host responses but had not yet serocleared, appear poised to potentially seroclear if the trends in the decrease of viral markers continues.

These are important data that are getting a lot of attention from key opinion leaders in HBV. We think they suggest that an RNAi compound like ARO-HBV has the

potential to be a backbone therapy in combinations aimed at achieving a functional cure of HBV. To us and many KOLs that we interact with, these data look as though ARC-520 treatment may have led to an awakening of the immune system, which is the key requirement for functional cures to occur and be sustained. Keep in mind that ARC-520 was designed to be active against all cccDNA derived mRNA transcripts, but missed transcripts from integrated DNA. ARO-HBV specifically addresses this deficiency. So we are more confident than ever about ARO-HBV and we are eager to see if this translates into improved patient outcomes or broader coverage of different patient populations.

Lastly, during the quarter we closed an equity financing with gross proceeds of $60.4 million. This strengthened our balance sheet so that we can continue to be focused on speed and move our development programs towards key milestones that could represent significant value catalysts.

With that overview, I'd now like to turn the call over to Bruce Given, our COO and head of R&D. Bruce??

Bruce Given

Thank you Chris and good afternoon everyone.

Our two clinical programs ARO-AAT and ARO-HBV are moving forward on the planned schedule, without any encountered delays so far. Our experience from prior clinical programs and relationships with investigators have made it possible to move these programs rapidly.

We are always looking for innovative new ways to do things, and this is certainly true for our clinical trial designs. As Chris mentioned, our first-in-human study designs for ARO-AAT and ARO-HBV are intended to get to data readouts on safety and activity rapidly and include both single dose and multiple dose cohorts. The single and multiple dose phases are designed to run almost in parallel, as opposed to sequentially, which could potentially shave months from more traditional development timelines of each product. We view these designs as essentially Phase 1/2 studies.

Let me illustrate how this is designed to work. For ARO-HBV, the site will bring in a cohort of healthy volunteers and each subject will receive a single subcutaneous dose of either ARO-HBV or placebo. Safety labs through 8 days are collected and reviewed by a data safety committee, or DSC. If these results are determined to be acceptable by the DSC, they will authorize two things:

1. The initiation of a multiple-dose cohort of HBV patients at the same dose level; and,
2. Escalation and enrollment of another single-dose cohort of healthy volunteers at the next higher dose level.

This same cycle will continue for each additional cohort until we dose escalate to the predefined top dose level of 400 mg.

ARO-AAT has a similar design, but will enroll healthy volunteers for both the SAD and MAD portions of the study. There are a few other minor differences, but the essential design is the same for both candidates. This means that both programs will potentially have data readouts around the same time if healthy volunteer and patient accrual proceeds at approximately the same pace.

For both candidates, the protocols call for studying doses of 35, 100, 200, 300, and 400 milligrams. Using fixed doses instead of scaling on a milligram per kilogram basis will simplify the process for the pharmacists at the sites and reduce the risk of dosage error. It ultimately may give opportunities for simplified commercial dosage forms, such as pre-filled syringes, that make it easier for patients and/or physicians to administer the product.

For both candidates, the primary outcome measures are safety and tolerability. For ARO-AAT, secondary outcome measures include pharmacokinetics, percent change in serum alpha-1 antitrypsin levels, and duration of response. For ARO-HBV, secondary outcome measures include pharmacokinetics, and an assessment of the change in all measurable viral markers, including s-antigen, DNA, RNA, e-antigen, and core-related antigen.

Both studies began dosing in March and, as I mentioned, they are progressing according to schedule at this point.

For ARO-HBV, we have enrolled and dosed the first three cohorts of 18 subjects in the SAD portion of the study at doses of 35, 100, and 200 milligrams. We have also received clearance from the DSC to begin the MAD portion of the study in HBV patients at the 100 milligram dose level. Patients are being screened and scheduled and we anticipate that the first patient will be dosed later this week, followed shortly by the rest of the patients in the cohort.

For ARO-AAT, we have enrolled and dosed the first three cohorts totaling 20 subjects at doses of 35 and 100 milligrams. We have received DSC clearance to

escalate to 200 milligrams and we anticipate that the third cohort will be dosed next week.

We are extremely pleased with the pace of enrollment for both studies and want to thank our clinical operations, manufacturing and programs management teams as well as our CRO and the clinical sites for all the hard work required to maintain our aggressive schedule. We are also gratified that the DSCs in both programs have found the accumulated safety information to be acceptable to allow dosage escalation without exception or delay.

It's still very early in both of these studies, but all the results to date build confidence about the candidates and about the potential for the TRiM™ platform more broadly.

With that brief review of our clinical programs, I'd like to turn the call over to Ken Myszkowski, Arrowhead's Chief Financial Officer. Ken?

Ken Myszkowski

Thank you Bruce, and good afternoon everyone.

As we reported today, our net loss for the quarter ended March 31, 2018 was $14.9 million, or $0.18 per share based on 84.1 million weighted average shares outstanding. This compares with a net loss of $6.0 million, or $0.08 per share based on 74.6 million weighted average shares outstanding, for the quarter ended March 31, 2017.

Revenue for the quarter ended March 31, 2018 was $0.7 million, compared to $9.0 million for the quarter ended March 31, 2017. Revenue was lower because revenue from the $30 million upfront payment received from Amgen for the ARO-LPA, now called AMG 890, agreement was fully recognized in October 2017. Revenue in the current period primarily relates to the recognition of a portion of the $5 million upfront payment received from Amgen for the ARO-AMG1 agreement. Of the total upfront payments of $35 million, all but $1.3 million has been recognized as revenue to date, and the remainder is anticipated to be recognized over the next 6 months.

Total operating expenses for the quarter ended March 31, 2018 were $15.7 million, compared to $15.1 million for the quarter ended March 31, 2017. This slight increase is primarily due to drug manufacturing and toxicity study costs for our ARO-AAT and ARO-HBV candidates, partially offset by reduced clinical costs as we were closing out our discontinued candidates in the prior period.

Net cash used by operating activities during the quarter ended March 31, 2018 was $15.4 million, compared with net cash used by operating activities of $14.3 million during the quarter ended March 31, 2017. This slight increase was also driven by the increased drug manufacturing and toxicity study costs for our ARO-AAT and ARO-HBV candidates.

Turning to our balance sheet, our cash and short-term investments totaled $91.5 million at March 31, 2018, compared to $65.6 million at September 30, 2017. In January 2018, we completed an equity financing, issuing 11.5 million shares, which resulted in $56.6 million of net cash proceeds to the Company.

Our common shares outstanding at March 31, 2018, were 87.6 million.

With that brief overview, I will now turn the call back to Chris.

Chris Anzalone

Thanks Ken.

As you've heard, we've accomplished a lot in the first 3 months of the year and have already begun answering key questions. We expect the remainder of 2018 to be even more productive. Here are a few key goals we have for the rest of the year:

1. We anticipate that we will complete dosing in both ARO-HBV and ARO-AAT first-in-human studies. As Bruce mentioned, the studies are progressing well. So what does that mean for the timing of data readouts? We hope that we will have a meaningful amount of data for both programs to submit late-breaking abstracts for AASLD. If accepted, that would mean presentations on one or both programs at the Liver meeting in November. The timing for that is very tight, so we cannot guarantee that we make the deadline, but that is our goal.
2. We are on schedule to file CTAs by the end of the year for ARO-APOC3, ARO-ANG3, and ARO-ENaC.
3. We intend to provide more data on ARO-ENaC and the expansion of our TRiM^{TM} platform into diseases of the lung. This includes presentations at multiple medical and scientific meetings throughout the year and an Arrowhead hosted analyst day in the summer to discuss the pulmonary platform in detail.

4. Exploit opportunities to maximize the value of our technology through partnering and collaborations. This would potentially allow us to focus our internal development on a select number of our lead candidates and also gives us exposure to additional high value opportunities that may be beyond the reach of our current resources. And;
5. Present data on our various pipeline products and on the TRiM™ platform through medical and scientific meetings and through publication in peer-reviewed journals.

This is, indeed, a big year for us. Thanks again for joining us today. I would now like to open the call to your questions. Operator?

Operator

Operator opens the call to questions …