FIFTYONE CAPITAL

PARADIGM BIOPHARMACEUTICALS LTD

ON THE ROAD FOR FURTHER DUE DILLIGENCE

8th March 2019

Recently, we travelled to Germany to undertake additional due diligence on Paradigm Biopharmaceuticals Ltd (ASX: PAR), to gain a deeper understanding of the business. Last year, we expressed our confidence that Paradigm would pass their phase 2b Osteoarthritis (OA) clinical trial (which was successful) and believed that the business was significantly undervalued. After this due diligence trip, we are extremely confident in the long-term prospects of Paradigm, and it has further validated our views on the company.

To review our previous detailed notes on Paradigm, please see our "Market Insights" page:
June 2018
November 2018

Highlights

- Exclusivity of supply with bene pharmaChem is a substantial moat for Paradigm that the market does not understand.
- Bene are the only approved supplier of PPS and no other company has achieved bio-equiveillance (i.e. no generics) giving protection past patent life.
- Orphan indication (MPS) has seen excellent results using PPS – Paradigm could commercialise iPPS upon successful trial results with extremely high unmet need & demand for product.
- Ability to collect more real world data via SAS scheme in MPS and other lysosomal storage diseases (will allow investors a look through to potential trial outcome prior to read out).
- OA clinical trial progressing to phase 3 on excellent phase 2 results. Deal size must be comparable to nearest competitor in production (Tanezumab US$1.8b).
- Strong possibility of first revenue in 2020 from provisional approvals in Australia (estimate could see ~$25m first year of revenue) – can be done without phase 3 trial.
- Ramp up of marketing & exposure from forthcoming NFL treatment program as well as continued SAS program in Australia for OA.
- Robust pipeline of future indications that could be commercialised.

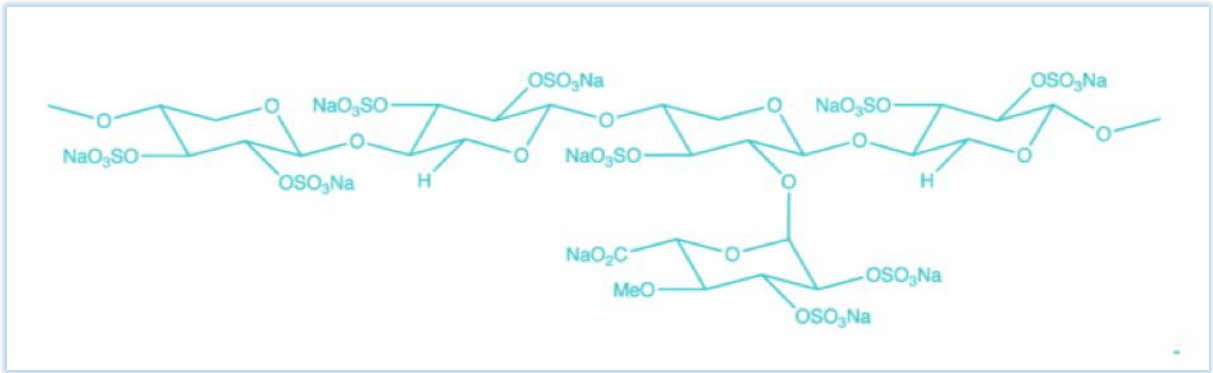
PENTOSAN POLYSULFATE SODIUM & BENE PHARMACHEM

During the trip to Germany, we met bene pharmaChem who are the manufacturers of Pentosan Polysulfate Sodium (or PPS for short). Bene is a family run, private business and has been manufacturing PPS since the 1940s. Over generations bene have refined the manufacturing process and secret recipe down to a fine art. There is a difficulty and complexity in manufacturing PPS which significantly underappreciated.

Bene has four different production sites in total and manufactures several other pharmaceutical products. We were extremely impressed with the custom designed facility that is dedicated solely to the manufacture of their flagship drug, PPS. Bene employs over 175 staff and is the only FDA approved supplier of PPS.

Bene PharmaChem facility where PPS is manufactured using custom designed equipment and proprietary manufacturing processes.

While the molecule of PPS is not new, the manufacturing procedure of turning a beechwood tree into PPS is exceptionally complex with hundreds of steps and processes in each various phase of production. Cumulatively this equates to millions of potential variations based on any single change to just one of these processes.



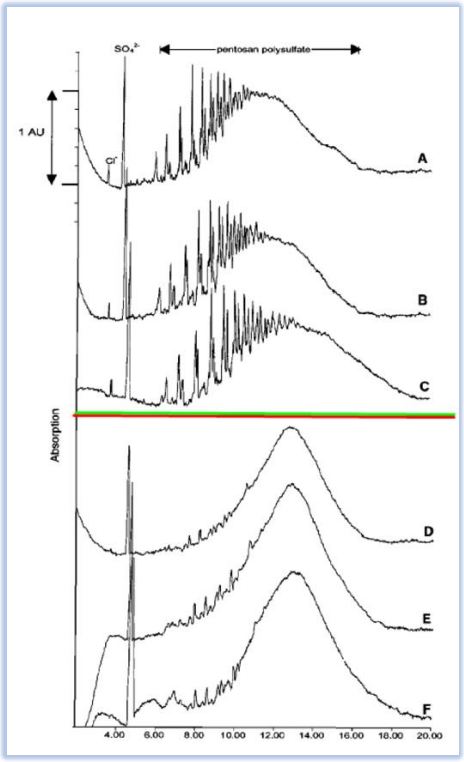
PPS Molecule – very complex in structure and in manufacturing technique

By way of example, one small alteration in any one of the steps, such as the quality of the charcoal, beechwood chips or temperatures can alter the final product and drug molecule. It's variations such as these that cause headaches for competitors who struggle to replicate PPS to a standard that is accepted by regulators. If the end molecule doesn't match the bene approved PPS on file with the FDA, it cannot

be classed as PPS (not bio-equivalent). The manufacturing consistency and technical know-how developed over generations by Bene is the reason their PPS is so difficult to replicate.

Bene discovered the PPS molecule and have perfected the manufacturing process across generations. This timely process has allowed Bene to achieve batch consistency for their PPS and as a result, they remain the only FDA approved producer of PPS inside the US as well as other regions (i.e. no generic form of PPS is available for human consumption).

The below illustration from a structural study on PPS by ***Degenhardt M et.al***, shows the differences between one competitor product & Bene's PPS. The study showed the difficulties that other manufacturers have in replicating PPS, by confirming that the competitors' batches did not match the PPS monograph of Bene. Degenhardt also noted that "minor variations in the molecular shape and size of a drug can have profound effects on its pharmacological activities." Therefore the FDA and other regulators have yet to approve other PPS manufactures.



Monograph of 2 different PPS manufactures (A,B,C bene) – competitor products have yet to achieve GMP & batch consistency to match molecule produced by bene.

After several days with the Bene team discussing the challenges and production process to create PPS, we left confident that the manufacturing facility and process would be extremely costly and difficult to replicate. Much of the equipment used in their facility has been specifically designed and custom-built using IP provided from Bene (i.e. you can't buy this equipment off the shelf).

One anecdotal story we were told during our trip, involved a major pharmaceutical company trying to undertake the manufacture of PPS during the 1970s. This company spent millions on developing the process for manufacturing PPS. But was unable to achieve batch consistency and ultimately abandoned the project. They returned to sourcing material from Bene.

Bene really are the 'gold standard' of PPS manufacturing and the partnership with Paradigm will be very beneficial for both companies as we outline below.

THE NOT SO GENERIC – ELMIRON

Currently, the primary use of PPS produced by Bene is for Elmiron, a drug sold by Jensen, a subsidiary of Johnson and Johnson (J&J) who purchase PPS from Bene. Elmiron is used to treat inflammatory bladder syndrome (interstitial cystitis or IC) and is classed as an orphan drug as it is a relatively rare disease. *Note: The fact that the one of the largest pharmaceutical company in the world (J&J) are sourcing PPS from bene is testament to the quality and difficulty to replicate the production of PPS.*

While there's only a small number of people who suffer from IC (*estimated 4-12m people in the US*), sales of Elmiron are estimated at between US$240m - US$500m each year. We have demonstrated below how strong the IP around PPS is using Elmiron as an example... Generic you say?

Sculpture at Bene made from a Beechwood Tree (the primary ingredient in PPS) which depicts a human bladder - of which PPS treats with the drug Elmiron.

The FDA first approved Elmiron in September of 1996. The corresponding patents then expired on the 19th of January 2010 opening the gateway for generic drugs to steal away market share. However, since this time there has been NO GENERIC forms of Elmiron available for purchase inside the USA. In 9 years since being off patent, no competitor has emerged, not for lack of trying, but because Bene is still the only recognised and FDA approved supplier of PPS inside the US. Like Paradigm, J&J have exclusivity of supply with bene for IC, locking out any potential competitors. In fact, in recent years, J&J has even INCREASED the price of Elmiron!

Insurers are also passing on the rising cost of garden-variety drugs to Medicare patients. For example, Judy Robbins, 75, of Boston, Massachusetts says her costs for Elmiron, a drug she has taken for bladder pain for many years, shot up from $95 for a three-month supply in November, 2015 to $335 in February, 2016. "I called the insurance company to ask what's going on," says Robbins. "They told me that I'm still paying the same percentage of the cost–about half–but that the price of the drug had risen to over $600." Robbins says that she has now cut back on how much of the drug she takes to stretch her supply.

Article illustrating price increases on Elmiron. Note: These price increases are from J&J and not due to price changes from bene. Paradigm have a fixed purchase price agreement from bene and any increase to drug pricing adds to the top line margin.

Paradigm not only have extensive patent protection over the use of PPS for the numerous indications they have, but they also hold exclusivity of supply from bene. Therefore, even when the drug does come off patent, they may not see any generic competition which would result in no impact to their sales margins.

From a valuation perspective, this makes a big difference when looking at the value of future cash flows. For example, if Elmiron had generic competition when it came off patent in 2010, the price may have fallen around 85% (assuming 200,000 units sold per year and using the two different price points of $1,250 & $187.50 for non-generic and generic product). Extrapolating the difference in gross revenue over this 9-year period results in a potential difference of $1.9 billion in gross revenues *(i.e. J&J has earned $1.9b more due to the fact no competitor can produce a generic PPS)*.

Units Sold per Year		**200,000**	**9 Years Revenue Gross**	
Cost per Unit (no generic)	$	1,250.00	$	2,250,000,000
Cost per Unit Generic (-85%)	$	187.50	$	337,500,000
Difference	**$**	**1,062.50**	**$**	**1,912,500,000**

The value of not having generic competition has likely yielded billions of dollars in additional revenue to J&J since patent expiry in 2010.

We believe other investors have not recognised this additional moat, but we feel it's a particularly valuable part of the Paradigm story. Not only is there potential for Paradigm to generate substantial gross margins and free cash flow for longer than their patent life, but they also have reduced costs and time to market by repurposing an existing molecule in potential blockbuster indications. In theory, this manufacturing protection around PPS should increase the intrinsic value of future cashflows as they should remain higher for longer (i.e. without generic competition after patent life, the company generates substantially more revenue and profits).

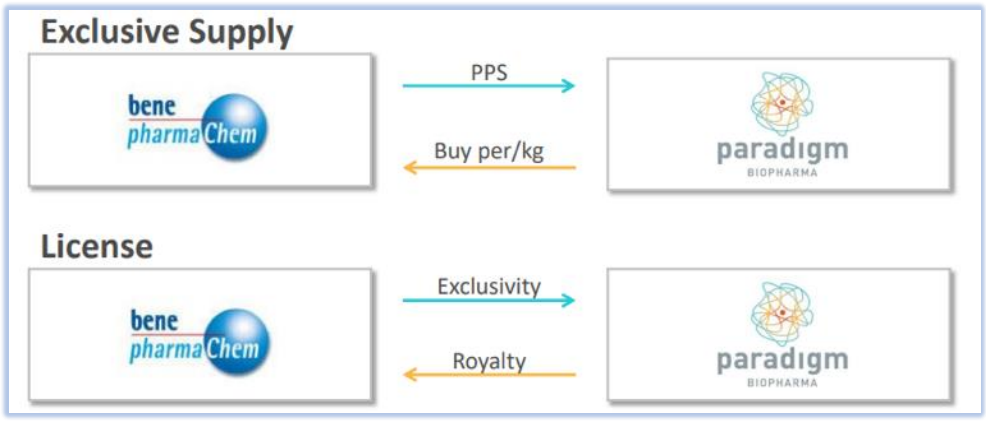
Again, the theory behind this moat is one might expect that Paradigm should trade at a premium to peers who otherwise are at a higher risk of generic competition (i.e. competitors who only have protection for the life of their patents).

Note: While Elmiron has had nine years of un-interrupted pricing power, the FDA is currently reviewing an application for a competitors' generic Elmiron - a company from India, Alembic Pharmaceuticals (who manufacture generic drugs). The results of the FDA's decision will determine whether the generic PPS manufactured from Alembic can be considered a bio-equivalent of Bene's PPS (we are led to believe it won't). We also note that Alembic Pharma has had several audits from the FDA which has resulted in 'observations' which are filed due to the conditions violating FDA requirements. If the FDA decides that the competitors' PPS does not have bio-equiveillance to Bene's PPS, then Elmiron will continue without a generic and Paradigms future drugs could also have this added layer of protection.

PARTNER PROTECTIONS

Paradigm has exclusivity on the commercial supply for PPS, an agreement with Bene that is updated each year, or when Paradigm in-license new patents (such as the recent MPS indication). With Paradigm holding patents around the use of PPS to treat various indications. It would be pointless for Bene to supply PPS to a competitor - as the competitor could not sell a product without violating Paradigms patents. Therefore, it's better to work together in a mutually beneficial partnership.

The diagram below illustrates the exclusive supply and license agreement with bene. Paradigm buy PPS from bene (similar to how J&J buy PPS for Elmiron). Then, when Paradigm successfully commercialises a product using the PPS, they will pay a small royalty back to Bene (again, similar to how J&J would with Elmiron sales).



Paradigm have exclusive supply from Bene who in turn will benefit from a single digit royalty paid back on commercial sales.

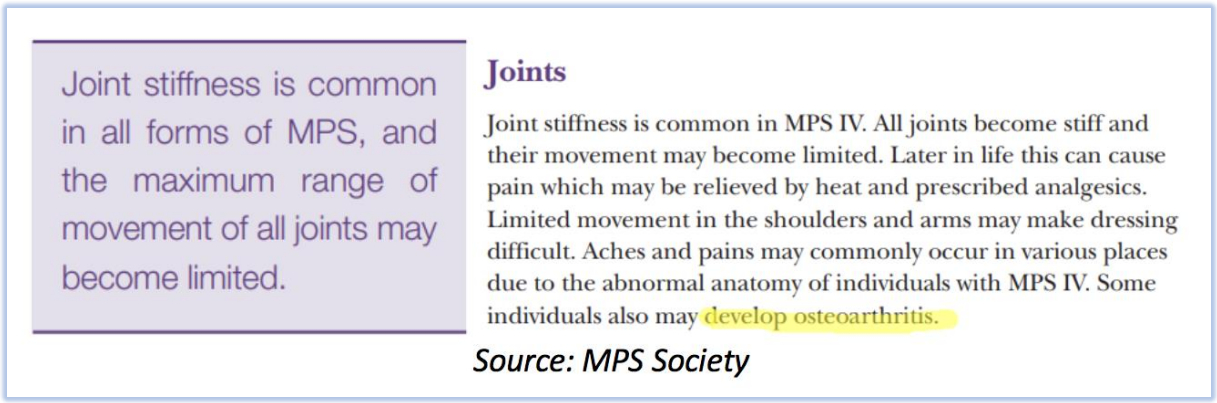
After reviewing the impressive Bene facilities and understanding the warehousing capabilities for PPS, we don't foresee supply disruption as a significant risk. Bene could quite comfortably increase production of PPS and have planned for such expansion at their existing facilities. As an example, production and supply for Elmiron have not been interrupted since 1996, and the company has been producing PPS consistently since the 1940s. Again, Bene are GMP certified, audited frequently by regulators such as the FDA and customers like J&J, insuring they maintain very the excellent quality and standards expected.

MORE INDICATIONS & MORE PPS

While Osteoarthritis (OA) is Paradigms' headline indication, they are not a one trick pony. It seems, however, that the market is entirely oblivious to how exciting their new rare disease indication is.

On the 22nd of November 2018, Paradigm announced the In-License for Mucopolysaccharidosis (MPS) from Mount Sinai hospital. Since then we have spent a considerable amount of time researching and better understanding this disease and how PPS works in treating it.

Given that MPS patients experience joint pain and similar symptoms to OA, there is a good chance that PPS will be able to help these symptoms and relieve some of that pain.



We encourage investors to learn more about MPS here: https://mpssociety.org/learn/education/booklets/

On our own journey to learn more about MPS - We attended the WORLD Symposium (rare disease conference in Orlando Florida) where we met with a number of key opinion leaders (KOL) familiar with the use of PPS in treating patients with MPS.

What stood out the most, was the clear unmet need in this indication. Families, clinicians and essentially anyone touched by this disease are desperate for a drug that can help the pain associated with the muscular-skeletal issues and associated pain that develop as the disease progresses. MPS is a progressive disease, and these patients have no real solution as their current enzyme replacement therapy (ERT) doesn't assist with joint related pain.

One clinician we met was Dr. Julia Hennerman, who ran the published Phase 2a open-label study in MPS using PPS (the study we mentioned in our November 2018 Paradigm note). The results from the [Hennerman et.al] study were very encouraging and showed significant pain decrease and reduction in GAGs from the PPS treatment administered in the study.

Fig. 1 Urinary GAG concentrations on treatment with PPS. The *dotted line* indicates the upper normal range (UR) for urinary GAG concentrations in healthy adults. Urinary GAG concentrations were measured at baseline, and at week 12 and 25 (both 1 week after the last dose of PPS)

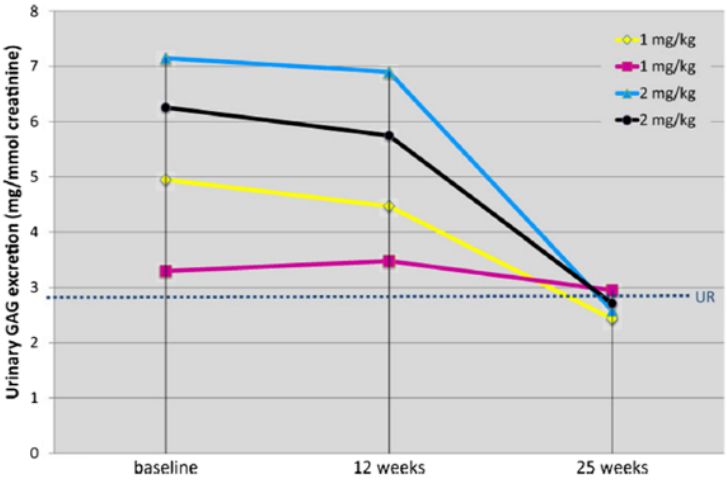
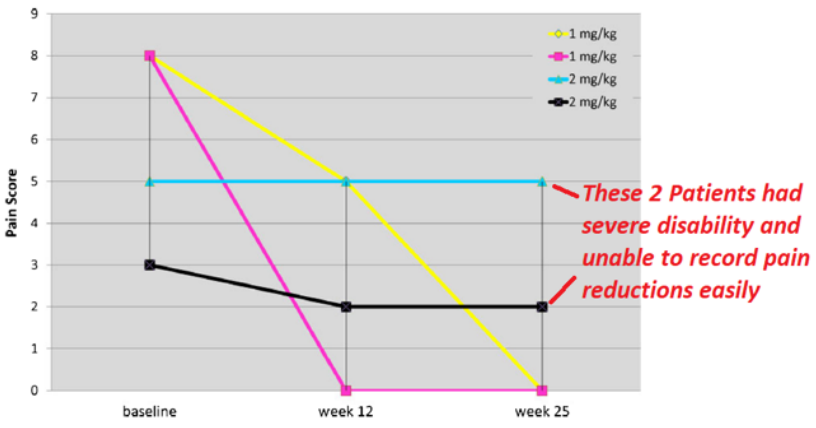


Fig. 3 Changes in maximum pain during the 24 week treatment with PPS. Pain was scored by the patients with "0" for no pain up to "10" for the most severe pain. Pain score was measured at baseline, and at week 12 and 25 (both 1 week after the last dose of PPS)



Results from the study show a reduction in GAGs to normal levels. Patients (yellow/pink) with normal cognitive function had a strong reduction in pain. Patients (blue/black) had severely progressed MPS and could provide only limited feedback on pain.

Dr. Hennermann believes that PPS had a clinically meaningful impact on the patients and even recounted that several families have since reached out to her trying to obtain PPS (which she has not been able to provide).

Dr. Hennermanns' view, and one that was echoed from a number of other KOL's we spoke to, was that should PPS achieve a clinically meaningful result in a placebo-controlled trial. There would be significant demand from patients given the lack of treatment options for this condition. Because this could be used in conjunction with existing enzyme replacement therapy the commercial opportunity for Paradigm is very exciting.

During our time at the conference, we heard many other anecdotal stories of people trying to take or source PPS for the various MPS conditions. We recount our first-hand experience: On the second last day of the conference during a poster presentation session. We were observing the poster presented from Dr. Furujo, which detailed the use of PPS in two juvenile siblings in Japan suffering with MPS.

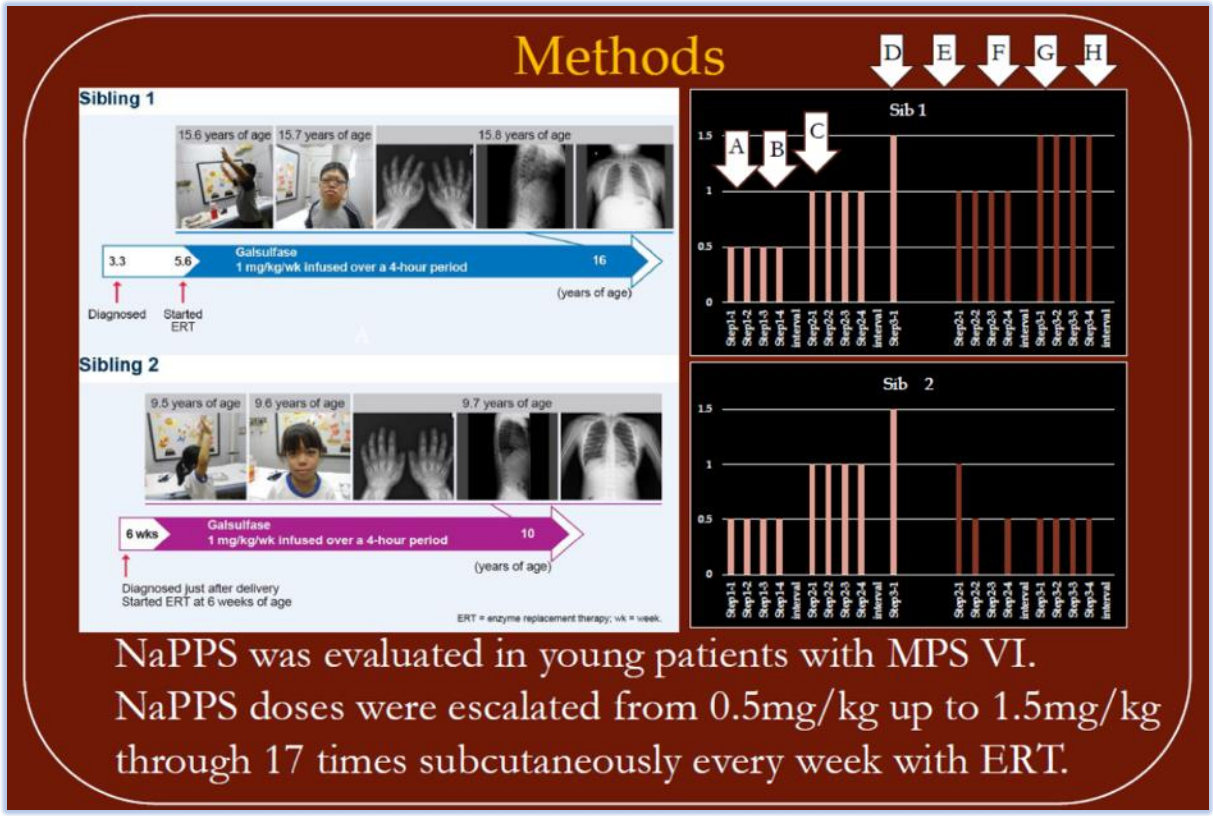


Image from ASX release of Dr Furujo's poster treating patients with PPS who suffer from MPS VI.

While Dr. Furujo was discussing the findings of her study, a woman approached us through the crowd and seemed extremely interested in the study results. After a short while, she mentioned that her child had MPS IV, and she was currently treating her with Elmiron (she lived in the US). When asked how she obtained Elmiron, she stated that she was purchasing it directly. She said they had been using it for around three years and believed it was having an effect. *Note: Oral PPS such as Elmiron has limited impact for joint pain as the molecule of PPS is too large to be absorbed through the stomach (but we refrained from mentioning this at the time) also taking Elmiron for sustained periods of time results in issues with digestion and things like stomach ulcers.*

She continued by saying how the injectable PPS is impossible to get and was interested in how or where she could try to source this injectable material.

We then informed her that Paradigm was currently in the process of setting up a clinical trial of injectable PPS for treating MPS. To describe her face at this news is impossible. Her relief, joy, confusion, elation, and desperation all came through at once. She was extremely excited by this news and hopeful an injectable version of PPS could be commercialised soon.

It was incredible that we managed to witness this first hand and it certainly left a lasting impression about the critical need for such a product. Ultimately, the unmet need in this terrible disease is a big opportunity for Paradigm, yet the market appears to ascribe no value to it.

With the studies from Dr. Hennermann & Dr. Furujo both showing positive impacts from the use of injectable PPS for treating MPS, we are confident Paradigm will be able to design a phase 2/3 trial

that can yield success and bring a drug to market. We look forward to going back to the conference one day and hearing the positive effects from patients and families hopefully using a drug Paradigm commercialise.

As demonstrated below, ongoing assessment of the physical improvement in a 50yo female with MPS 1. The subject is now able to use chop-sticks and kneel, physical tasks which had previously been very painful or not possible.

Patients like those in Dr Furujo's study could see benefits to their daily living with successful commercialisation of PPS.

MPS SAS

Once the MPS clinical trial is designed, Paradigm is likely to start a special access scheme (SAS) arrangement for MPS and other lysosomal storage diseases in Australia (similar to what they did with OA). This will allow Paradigm to gather valuable real-world evidence outside of the trial data on the impact PPS is having in these patients.

Should the SAS data show a positive effect for MPS or other lysosomal storage disease patients they treat, the market may start to factor in a successful result in the clinical trials. It's extremely rare that investors can observe potential trial outcomes at the same time as the trial itself is running.

We are excited to see how MPS patients, and potentially other patients with similar symptoms respond to the treatment with PPS. While the design of the trial has yet to be finalised, the SAS program should give good early indications of what the outcome may be. This could then result in significant label expansion for PPS in these orphan indications, adding significantly to the future development pipeline of Paradigm. This is a multi-billion-dollar revenue opportunity being completely missed by the market.

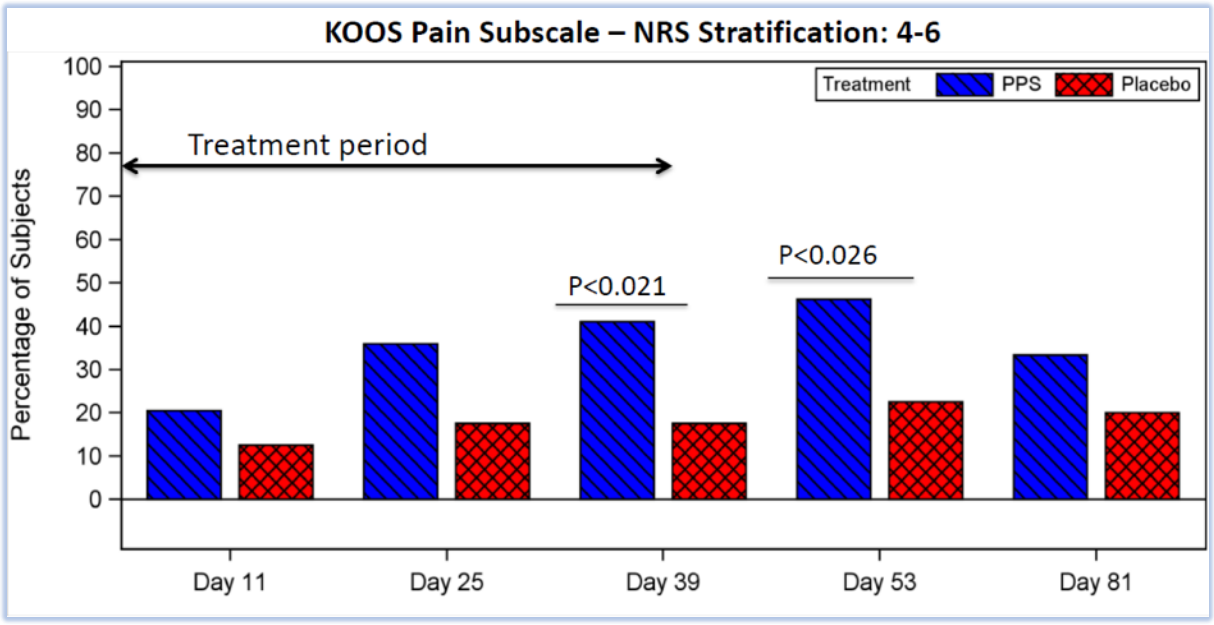
SUCCESSFUL PHASE 2B OA CLINICAL TRIAL

As we had mentioned in our research last year, we were confident that Paradigm would pass their phase 2b trial in OA. When the results were announced in December 2018, we were extremely excited to see that our detailed research was validated, and Paradigm had passed the phase 2b clinical trial. Upon the announcement, the stock initially traded much higher but proceeded to sell off as people started taking profits.

As the release was just prior to Christmas, perhaps the timing wasn't great? Maybe the market volatility wasn't favourable? That time of year is also typical of limited new buying volume with most funds not adding new positions prior to Christmas. As the share price fell, it seemed to have an almost cataclysmic effect on people who ultimately then began to question the results. Was a pass bad? Could something be missing? Why was it dropping? All these questions and worry continued to fuel much of the chatter around the company.

Sometimes markets do strange things, and unless you have a clear understanding of what you own and why, you can't take advantage of opportunities. We have detailed below some of the critical points we feel are significant for the company.

Firstly, the company met the primary endpoint (change in KOOS pain score at day 53) in the Numerical Rating Score (NRS) pain group of 4-6. This marked a clinically meaningful and statistically significant result against placebo. The results demonstrated that 46.2% of subjects who received Zilosul® (Paradigms registered trademark for PPS treatment in OA) had a reduction in pain over 50% at day 53 (P=0.026).



The data confirmed that PPS has a substantial impact on pain levels in OA patients. Not only that, the secondary outcome of 'Patients Global Impression of Change' (PGIC) came in highly significant (P=0.0062).

These results are excellent, as it shows that the patients are experiencing a positive impact on their daily activities from the treatment. Pain relief is just the beginning for these patients, as they also notice simple things like being able to walk downstairs again, getting dressed easier, sitting down or other daily tasks that previously their OA limited them from doing. The PGIC measurement considers more than just pain which is a vital efficacy measurement. If patients see results in their daily living, they will be highly satisfied taking the drug. While PGIC is a secondary endpoint, it also corroborated what was reported in the SAS data.

Finally, and most importantly, the safety profile of PPS remained intact. The company reported no serious Adverse Events (AE) in the trial and only mild/moderate events were reported. The most common complaint was of bruising/redness around the injection site (which is to be expected when you are receiving 12 injections over a 6-week period).

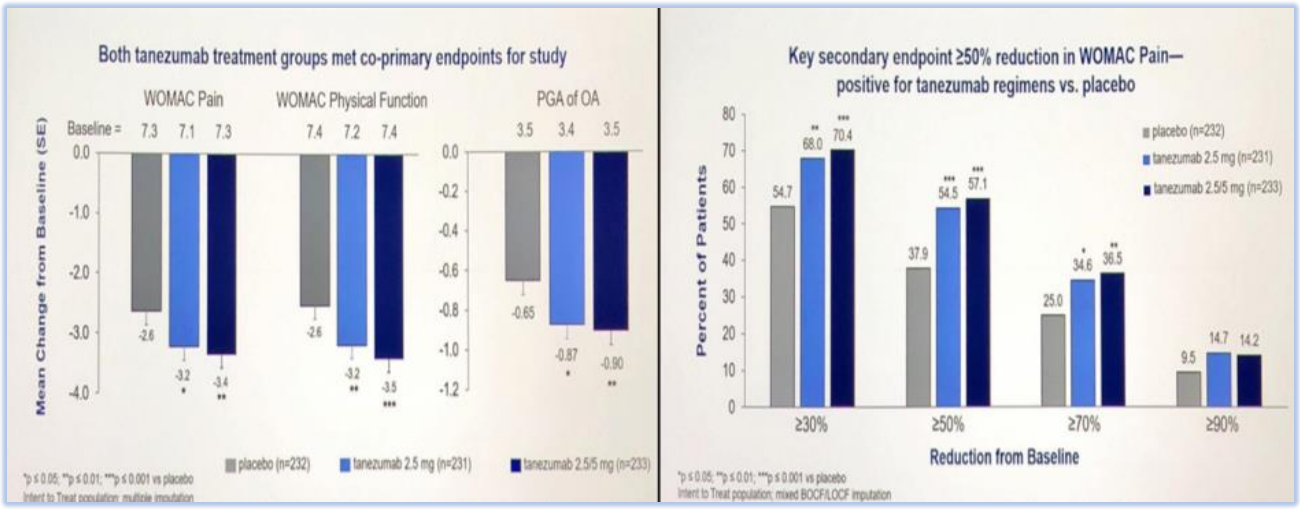
The mild AE's are unlikely to deter people from treatment given the strong PGIC scores witnessed in the trial. In fact, we've already heard of people seeking additional injections under the SAS program for repeat treatment – which further validated the commercial success Zilosul® could experience once they've passed the phase 3 trial.

Ultimately, the results presented were excellent. The Phase 2b clinical trial data provides the company with a green light to progress partnering for the pivotal Phase 3 trial. It was always known that PPS had the best effect for people with moderate to severe OA, so the fact that the higher pain group didn't

have as much response doesn't necessarily mean they won't seek treatment. For example, if you had severely progressed OA, and the doctor advised you to get a knee replacement, but Zilosul® had just come onto the market, then it's likely patients would try using the drug before getting their knee replaced. I know I would!

The only other drug that looks comparable to PPS is the anti-NGF (nerve growth factor) drug currently in clinical trials which is produced by Pfizer and Eli Lilly – Tanezumab. We have discussed Tanezumab in previous notes, so we won't go into significant detail.

However, with regards to commercial terms for deal size, we have previously referenced this as a benchmark. The deal for Tanezumab was valued at US$1.8b, and we believe that post the phase 2 results, this is still the line in the sand for any commercial partnerships.



Results from Tanezumab trials showing similar reductions in pain as PPS (above). However, Tanezumab also had a much higher rate of adverse events being experienced as demonstrate below.

Number (%) of patients	placebo n = 232	tanezumab 2.5 mg n = 231	tanezumab 2.5/5 mg n = 233
Adjudicated joint safety events	5 (2.2)	14 (6.1)	18 (7.7)
Normal progression of OA	5 (2.2)	8 (3.5)	17 (7.3)
Rapidly progressive OA type 1	0	3 (1.3)	1 (0.4)
Rapidly progressive OA type 2	0	2 (0.9)	0
Primary osteonecrosis	0	0	0
Other (pre-existing SIF)	0	1 (0.4)	0

Incidence of RPOA (type 1 + type 2; 6/464, 1.3%) in combined tanezumab group aligned with expectations based on the risk mitigation procedures used

- Both RPOA-2 events occurred in index joints that were K-L Grade 4 at screening
- All RPOA-1 events occurred in joints with K-L Grade 2-3 OA at screening and 3/4 occurred in index joint
- One patient each with RPOA-1 and RPOA-2 events had a TJR in that joint

Adjudication endpoints also included subchondral insufficiency fracture and pathological fracture, each which had 0 patients SIF = subchondral insufficiency fracture

As illustrated above, the prominent issue for Tanezumab continues to be around safety. The FDA has previously placed the anti-NGF drugs on clinical hold due to the serious adverse events. It will be interesting to see how regulators view these results given the AE still appear to be elevated in Tanezumab relative to the placebo control arm.

The point being, Paradigms' Zilosul® looks comparable to Tanezumab in terms of efficacy but without the serious Adverse Events. If the deal size for Tanezumab was US$1.8b, then given the commercial aspect of both drugs being commercialised, it comes down to which one will sell better. Tanezumab with their serious AE's or Paradigms' Zilosul®?

Looking at Tanezumab & Zilosul® side by side, we believe patients would rather accept treatment from a drug that has a lower risk of serious Adverse Events and achieves a similar end result. With this in mind, Zilosul® should outsell Tanezumab. Perhaps the more frequent dosage requirements of Zilosul® would be a factor (Tanezumab injection is every eight weeks, Zilosul® twice weekly for six weeks), but once commercialised it is likely Paradigm would work towards a product that could be administered easily at home (like insulin and other home injectable products). Tanezumab could not be stored like this (discussed in previous notes).

Examples of at home injectable products like insulin. Source: Google

Non-opioid pain relief for chronic pain such as OA has been dubbed the 'holy grail' and yet, investors seem to have entirely overlooked Paradigms' trial success. While the Tanezumab deal sounds big (US $1.8b), analysts believe Tanezumab could easily be a >$4.5b per year franchise. However, with adverse events an issue, many analysts are concerned that the sales may not live up to expectation (i.e. doctors could be hesitant to recommend a product where patients health could deteriorate). With Paradigms' Zilosul® not even on the radar yet, it seems only a matter of time before the company valuations start to reflect the opportunity next to their nearest comparable.

HITTING THE BIG LEAGUES WITH THE NFL

With Paradigm only having released the top-line results from their phase 2b study, and no peer-reviewed journal published yet, the company is widely unknown to many investors. With a planned 'Expanded Access' treatment program in the US (like SAS in Australia) for NFL players, we expect Paradigm to start receiving some major exposure in the world's biggest pharmaceutical market.

It was recently reported that Todd Gurley of the LA Rams (who just played in the super bowl) has arthritis in his knee. If Paradigm can run a successful campaign in treating ex-NFL stars, it won't be long before they gain exposure across all major newswires in the country. Given the cost to have players like this benched any success would be a major publicity event.
Note: Todd Gurley signed a $57.5 million-dollar contract with the Rams.

The prognosis for OA due to acute sports injuries is not good and limit a player's effectiveness –success in treatment of NFL players would result in major press for Paradigms Zilosul®.

REVENUE 2020?

While market recognition is one thing, commercial validation is another. The SAS program Paradigm is running in Australia has been successful and demonstrates the demand for Zilosul®. Over 500 people have been treated to date, with many more on the waiting list. The commercial significance of this, is that Paradigm has an opportunity in Australia to be awarded Provisional Approval by the TGA.

Provisional approval would mean that Zilosul® would be removed from the SAS program and then become commercially available for purchase in Australia. Meaning patients could purchase the drug from a larger number of sites to treat their OA generating first revenues for Paradigm prior to completing a Phase 3 study.

If awarded provisional approval, it will allow Paradigm to set an initial price for Zilosul® (based on our market research, we estimate at the time of writing the OA product would cost around $2,500 per 6-week treatment or ~$200 per injection). While this will generate revenue for Paradigm, it will also show the demand for the product from clinicians and patients.

Given the unmet need for OA and the growing number of people who have already had a positive experience with the drug on the SAS program, it's likely sales will progress very quickly. This could mean first revenues as early as 2020. Treating only 10,000 people at a price of $2,500 per patient, it would generate revenue of $25m for Paradigm.

As an example, Clinuvel (ASX:CUV) is an Australian listed (as well as US & EU listed) biotech for the treatment of a very rare skin disease. Again, an indication that has unmet need, but a much smaller comparable market than OA. Clinuvel has recently seen revenue grow to around $25m and expects to double this with FDA approvals. Their market cap is now A$1.25b.

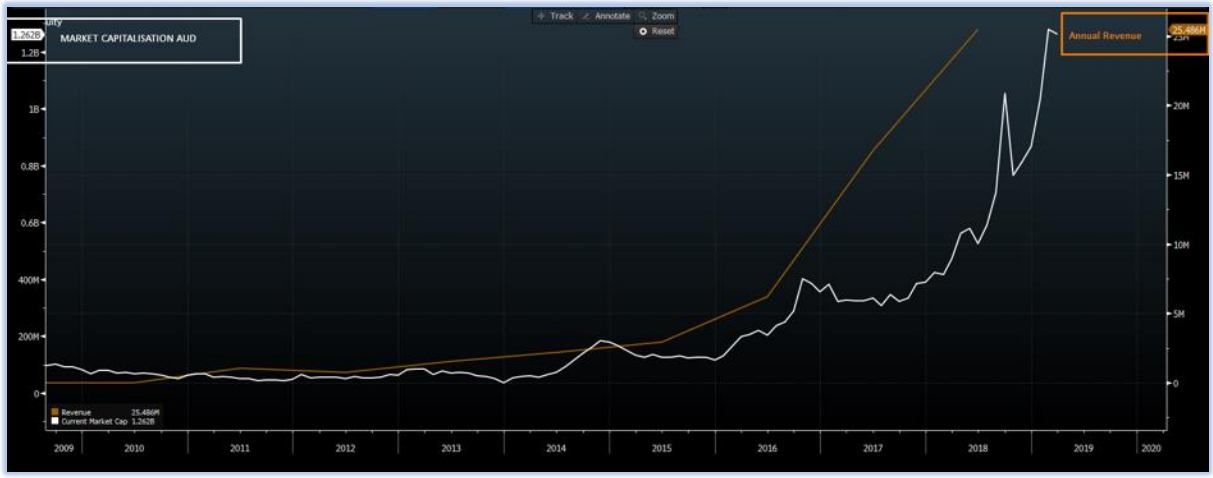


Chart of CUV AU Market Cap showing valuation of $1.25b on current annual revenue of $25m

If Paradigm receives provisional approvals from the TGA and generate similar revenue, the valuation could far exceed Clinuvel, given the market for OA is materially larger. The below graph shows Paradigms share price & market capitalisation at present. For a company with potentially 2 blockbuster indications coming to market (not to mention if they do a deal at valuations of US$1.8b), first revenues in 2020, significant protections outside of their patents and a robust pipeline of future products. We feel the stock should probably trade around a $500m - $750m market capitalisation prior to any phase 3 results.

Note: Other companies in similar positions (successful phase 2b trials in blockbuster indications) listed on the NASDAQ have market capitalisations that far exceed this range. Should Paradigm have success treating NFL players and attract US domiciled investors the company valuation could easily eclipse this estimate. If a deal is signed that values the indication in line with Tanezumab (US$1.8b), this valuation range would need to be revised materially higher.

Paradigm could potentially see material upside to their valuation upon any Big Pharma transactions, success in treating NFL players or provisional approvals. Our view is that valuation risk is asymmetric to the upside.

CONCLUSION

To simplify our view, we see it like this:
Paradigm has exclusive access to a drug (PPS) that has excellent safety history and multiple methods of action (i.e. could be used in multiple different indications) that have been under-explored.

Paradigm is focused on re-purposing this drug into numerous indications and have developed a strong partnership with the only FDA approved supplier of PPS. This moat adds another layer of protection to

the company outside of their patents creating a unique monopolistic situation for the company to capitalise on.

The real-world data that continues to be collected by Paradigm through their SAS program continues to build our confidence that they can successfully commercialise at least one, but more than likely numerous products using PPS for different indications. The pipeline of opportunities in the company's current and anticipated future R&D pipeline are very exciting.

As research begins in potential new indications using PPS, Paradigm seems the obvious choice to commercialise any indications that show promise. Thus, effectively cornering the market for this multi-method of action molecule. After learning more about PPS and after discussions with KOLs and researches. We realise we drastically underestimated how many indications PPS could potentially work within. While it is still early days, the successful OA trial is the first step of what is likely a long and robust pipeline of potential new indications Paradigm could bring products to market for.

We have undertaken a monumental amount of research on this company and have detailed our findings in these deep dive reports. We hope these have been beneficial for our investors (and future investors) to see our level of conviction and understanding around this business. We have enjoyed writing these notes and challenging our views. We really do believe the best years are ahead for Paradigm and as they keep delivering we should be rewarded for our patience.

ABOUT FIFTYONE CAPITAL AND THE PROGRESSIVE GLOBAL FUND – GIVING OUR INVESTORS MORE

When we set up our fund, we wanted to do something different, and change the way people look at our industry. We believe there is inherent conflict between standard sell side research and those who read it. This is mainly because the company producing the research notes is usually receiving compensation. Compensation that the clients don't receive [as producing research is part of their business]. It becomes difficult to know why research was done, for what purpose and for who? Our business model seeks to change this – by giving back to our investors.

Putting our Fund's name alongside the companies we invest in can have associated risk, so we are extremely selective on the companies we write research on. We take a quality over quantity approach and seek to build a strong track record for identifying under the radar companies, with significant upside potential relative to the risks.

This deep dive research is part of what we do as fund managers. So, to share this research we will receive compensation from the company usually in the form of options, or shares, as we prefer to leave the cash inside the companies, we invest in.

These options we then allocate back to our fund, so our investors (unit holders in the fund) can share in the benefit of these options. Therefore, our investors not only benefit from this stock selection, but will also benefit from the additional alpha we return from these deals. Should the investment community use our research and we maintain a strong track record for identifying undervalued companies, this strategy should continue to provide more return for our investors.

Hopefully by sharing research like this and remaining transparent with our business model we can make things better for everyone. We always strive to give our investors more and will seek to maintain our track record for stock selection.

If you would like to be part of our fund and access additional alpha and research like this, please don't hesitate to get in touch admin@fiftyonecapital.com.

advice if required. We own shares in Paradigm Biopharmaceuticals (PAR.ASX) and have previously received compensation in the form of options to share our research on the company.

Sources:

1. *How many people suffer from IC. LINK*
2. *Elmiron price increases. LINK*
3. *MPS information. LINK*
4. *Todd Gurley Arthritis. LINK*