

EMV – Bringing faster stroke diagnosis

EMvision's (EMV.AX) "behind the scenes" Lab Tour and Clinical Use Case Q&A video presents an in-depth perspective on how its novel technology can meet clinicians' needs in managing stroke patients and address a number of limitations with the standard of care brain scanning technologies, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) scanning. (Link can be found below)

Meeting Clinicians' Needs

To initiate appropriate treatment, clinicians need to know:

- type of stroke – critical to determining treatment as the drugs for an embolic or clot stroke are likely to increase the bleeding in a haemorrhagic stroke.
- location of the stroke – helps to confirm diagnosis as site of the stroke should align with the patient's symptoms.
- status of blood flow in Large Vessel Occlusion (LVO) strokes
EMV's "Pulsatility" proprietary technique aims to determine the patients who are suitable for urgent endovascular clot retrieval (ECR) to restore blood flow.

EMV's pilot clinical trials supported its ability to determine the both the type and site of a stroke. Its "Pulsatility" function offers another significant aid to optimise stroke treatment.

EMV addresses some limitations of CT and MRI

- EMV's cost of ~US\$150K in comparison to US\$1-\$3m for CT/MRI units and ~US\$0.7-\$1m for 'mobile' CT scanners opens the opportunity for expansion of scanning services.
- Its size of under 100kg versus 'mobile' CT of ~0.4-1tonne offers easier and faster access to critically ill patients in the limited confines of Emergency, ICU and hospital wards.
- EMV uses low power EM signals and does not emit ionizing radiation. It is safer for patients as it doesn't require custom infrastructure (is self-shielded), allowing for routine monitoring by the bedside, ICU and stroke wards.
- Its Gen 2 device allows for a highly scalable standard ambulance model with a planned under-20kg weight and operated by trained paramedics. Current bespoke 'stroke' CT enabled ambulances uptake is limited by its ~\$1m+ cost to house the larger CT scanner and need for on board specialist clinical staff.

Valuation, Risks

MST valuation of \$5.52ps is derived from a risk adjusted (80%) DCF. Risks arise from funding, technical, regulatory approval and commercialisation requirements. The sector is competitive with new technologies in development, including the potential market entry of the EMTensor GmbH's scanner in 2022.



EMvision is developing a portable brain scanner for rapid, point-of-care stroke diagnosis and monitoring. Its advantages over current scanning technologies promise to change early stroke management. It is in the later stages of development as it begins pivotal trials.

Stock	EMV.ASX
Price	A\$2.10
Market cap	A\$162m
Valuation (per share)	A\$5.52

Potential next steps

Q2CY22	Start Gen 1 Registration Trials
Q2CY22	Keysight (NYSE:KEYS) strategic supply agreement
H2CY22	Trial Progress Updates
CY23	US, EU and Aust regulatory submission and approval

EMV Share Price (A\$) – 1 year



Source: FactSet

Rosemary Cummins

rosemary.cummins@mstaccess.com.au

Access EMV update

[EMV Behind the Scenes' Film with Q+A](#)

Financial Forecasts

EMVision Medical Devices

EMV-AU

Year end 30 June

MARKET DATA

Share Price	A\$	2.10
52 week high / low	A\$	1.77 - 3.42
Valuation (12 month forward)	A\$	5.52
Market capitalisation	A\$m	162.4
Shares on issue	m	77.3
Options	m	3.9
Other equity	m	6.0
Potential shares on issue (diluted)	m	87.2

12 month performance



INVESTMENT FUNDAMENTALS		FY20	FY21	FY22E	FY23E	FY24E
EPS Reported (undiluted)	¢	(5.7)	(12.0)	(6.8)	(5.4)	(5.2)
EPS Underlying (undiluted)	¢	(5.7)	(12.0)	(6.8)	(5.4)	(5.2)
Underlying EPS growth	%	n/m	n/m	n/m	n/m	n/m
P/E Reported (undiluted)	x	n/m	n/m	n/m	n/m	n/m
P/E at Valuation	x	n/m	n/m	n/m	n/m	n/m
Dividend	¢	-	-	-	-	-
Payout ratio	%	0%	0%	0%	0%	0%
Yield	%	-	-	-	-	-

KEY RATIOS (A\$)		FY20	FY21	FY22E	FY23E	FY24E
Forecast year end shares	m	64	72	77	82	82
Market cap (Y/E / Spot)	\$m	133.9	151.3	162.4	172.9	172.9
Net debt /(cash)	\$m	(5.4)	(9.7)	(7.8)	(19.2)	(15.8)
Enterprise value	\$m	128.5	141.6	154.6	153.7	157.1
EV/Sales	x	80.2	81.0	37.7	36.4	36.1
EV/EBITDA	x	(36.6)	(17.0)	(29.5)	(32.2)	(33.8)
EV/EBIT	x	(36.6)	(16.8)	(28.8)	(32.2)	(33.8)
Net debt / Enterprise Value	x	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)
Gearing (net debt / EBITDA)	x	1.5	1.2	1.5	4.0	3.4
Operating cash flow per share	\$	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)
Price to operating cash flow	x	(41.1)	(33.7)	(57.9)	(48.7)	(50.9)
Free cash flow	\$m	(3.3)	(4.6)	(2.9)	(3.6)	(3.4)
Free cash flow per share	\$	(0.05)	(0.06)	(0.04)	(0.04)	(0.04)
Price to free cash flow	x	(41.1)	(32.7)	(55.3)	(48.7)	(50.9)
Free cash flow yield	%	-2.4%	-3.1%	-1.8%	-2.1%	-2.0%
Book value / share	\$	0.09	0.14	0.11	0.24	0.20
Price to book (NAV)	x	24.2	15.1	19.1	8.7	10.5
NTA / share	\$	0.08	0.13	0.10	0.24	0.20
Price to NTA	x	26.5	15.8	20.3	8.9	10.8
EBITDA margin	%	n/m	n/m	n/m	n/m	n/m
ROE (Average Equity)	%	n/m	n/m	n/m	n/m	n/m
ROA (EBIT)	%	n/m	n/m	n/m	n/m	n/m
Interest cover (EBIT / net interest)	x	n/m	n/m	n/m	n/m	n/m

PROFIT AND LOSS (A\$)		FY20	FY21	FY22E	FY23E	FY24E
Total Revenue	\$m	1.6	1.7	4.1	4.2	4.3
COGS	\$m	-	-	-	-	-
Gross margin	\$m	1.6	1.7	4.1	4.2	4.3
Corporate costs	\$m	(5.1)	(10.1)	(9.3)	(9.0)	(9.0)
EBITDA	\$m	(3.5)	(8.3)	(5.2)	(4.8)	(4.7)
D&A	\$m	-	(0.1)	(0.1)	-	-
EBIT	\$m	(3.5)	(8.4)	(5.4)	(4.8)	(4.7)
Net interest	\$m	0.0	0.0	0.1	0.3	0.4
Non-operating income	\$m	-	-	-	-	-
Pretax Profit	\$m	(3.5)	(8.4)	(5.3)	(4.5)	(4.3)
Tax expense	\$m	-	-	-	-	-
Minorities	\$m	-	-	-	-	-
Underlying NPAT	\$m	(3.5)	(8.4)	(5.3)	(4.5)	(4.3)

BALANCE SHEET (A\$)		FY20	FY21	FY22E	FY23E	FY24E
Cash	\$m	5.4	9.7	7.8	19.2	15.8
Receivables	\$m	-	-	0.1	0.1	0.1
Inventory	\$m	-	-	0.0	0.0	0.0
PPE	\$m	-	0.1	0.2	0.2	0.2
Intangibles	\$m	0.5	0.5	0.5	0.5	0.5
Other	\$m	0.1	0.5	0.3	0.3	0.3
Total Assets	\$m	6.0	10.8	8.8	20.2	16.9
Accounts Payable	\$m	0.4	0.3	0.1	0.1	0.1
Borrowings	\$m	-	-	-	-	-
Leases	\$m	-	0.2	-	-	-
Provisions	\$m	0.1	0.2	0.3	0.3	0.3
Other	\$m	-	-	-	-	-
Total Liabilities	\$m	0.5	0.7	0.3	0.3	0.3
Shareholder's equity	\$m	5.5	10.1	8.5	19.9	16.5

CASH FLOW (A\$)		FY20	FY21	FY22E	FY23E	FY24E
Receipts from customers	\$m	1.0	0.5	2.2	4.2	4.3
Payments to suppliers and employees	\$m	(4.9)	(6.3)	(7.6)	(9.0)	(9.1)
R&D tax rebate	\$m	0.7	1.3	2.5	0.9	0.9
Interest	\$m	0.0	0.0	0.1	0.3	0.4
Tax	\$m	-	-	-	-	-
Operating cash flow	\$m	(3.3)	(4.5)	(2.8)	(3.6)	(3.4)
Capex	\$m	-	(0.1)	(0.1)	-	-
Acquisitions / Investments	\$m	-	-	-	-	-
Investing cash flow	\$m	-	(0.1)	(0.1)	-	-
Borrowings	\$m	-	(0.1)	(0.1)	-	-
Equity	\$m	4.3	9.0	1.1	15.0	-
Dividend	\$m	-	-	-	-	-
Financing cash flow	\$m	4.3	8.9	1.0	15.0	-
Change in Cash / FX	\$m	1.0	4.3	(1.9)	11.4	(3.4)
Year end cash	\$m	5.4	9.7	7.8	19.2	15.8

Investment Thesis

EMV has developed a new generation of brain scanning technology. It doesn't aim to replace CT and MRI scanning, rather act as a 'first responder' to rapidly diagnose the type of stroke so appropriate treatment can be initiated as quickly as possible. Early intervention is paramount as 'time is brain' and patient outcomes are shaped by the speed of restoring blood flow in the brain. Stretched hospital budgets limit the access to current Standard of Care (SOC), MRI and CT scanning, delaying treatment in the hospital. Outside the hospital, the current 'solution' of a CT scan-enabled ambulance is not scalable, limiting its advantages to only a few. EMV looks to change the paradigm through its Gen 1 scanner within the hospital and Gen 2 in the ambulance and other first responder settings.

EMV is preparing to start the pivotal trial of its Gen 1 scanner for use in hospitals. Its lower cost offers the potential for compromised hospital budgets to increase brain scanning capacity in the acute setting. Its more compact size presents the opportunity to scan the patient at their bedside. Currently, a seriously ill patient usually needs to be transported to the Radiology department, which brings significant risks.

The trial data will be used to support approval by the US Food and Drug Administration (FDA), the EU European Medicines Agency (EMA) and Australian Therapeutic Goods Authority (TGA).

MST's investment thesis is built around:

- A clear need for the product. The benefits of significant progress in stroke treatment are not being fully realised due to a lack of timely diagnosis. The cost is significant. Stroke is the second-highest cause of death worldwide.
- The targeted markets are significant. A stroke occurs every 40 seconds in the US. Assuming it takes ~20 minutes to read this report, 30 people in the US alone will have had a stroke. Strokes occur everywhere. Ambulances are usually the first medical resource to assist. MST estimates there are > 100,000 ambulances in the US and EU markets alone. EMVSc offers a complementary role to CT and MRI in the hospital setting as well, opening the opportunity to over 10,000 hospitals in the US and EU. At an estimated cost of US\$150K, these two regions alone create a potential market of ~US\$16bn. Stroke is the first target. As its role develops and use within hospital grows, additional demand is expected to grow the market.
- EMV plans to start its registrational trials for its Gen 1 in Q2CY22 for approval in the US, EU and Australian markets. Its pilot trial was very supportive of its ability to accurately localise the stroke and diagnose the type of stroke. In our view, in its well-advanced stage, EMV offers lower risk. In general, medical devices offer lower risk but smaller market value. The potential wide application looks to offer a significant market opportunity as well.
- Management is sound and well experienced in developing and commercialising new medical technologies. Many of the team, including Dr Ron Weinberger, CEO, were instrumental in bringing Nanosonics infection prevention technology to the market.

Valuation, Risks, Sensitivities

MST values EMV at \$5.52ps. EMV carries the usual risks of medical device development that include funding, technical, regulatory approval and commercialisation. It is yet to complete the trials to gain approval in key global markets. It is a new technology. Clinicians will require time to understand its role in managing stroke. MST forecasts may not eventuate or be delayed. The sector is competitive with existing technologies and the potential market entry of EMTensor's scanner in 2022 and other novel scanners in development. EMV will require additional funding to take its scanner to market. MST's forecasts have been based on EMV negotiating a distribution agreement to enter the key markets. It may choose another option, such as licensing or selling directly which would impact the financial assumptions.

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Level 13, 14 Martin Place, Sydney, NSW 2000

Main +61 2 8999 9988

www.mstfinancial.com.au