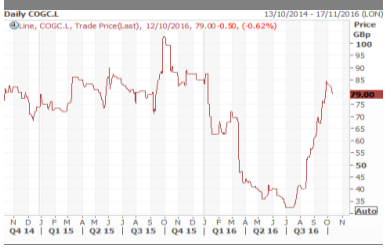
hardman&co

Pharmaceuticals & Biotech



Source: Eikon Thomson Reuters

Market data	
EPIC/TKR	COG
Price (p)	80
12m High (p)	102
12m Low (p)	30
Shares (m)	20.4
Mkt Cap (£m)	16.3
EV (£m)	15.0
Free Float*	53%
Market	AIM

**As defined by AIM Rule 26*

Description

Cambridge Cognition is a neuroscience technology company which develops and commercialises a complementary suite of near-patient assessment solutions to improve the understanding, diagnosis and treatment of neurological and psychiatric disorders.

Company information

CEO	Dr Steven Powell
CFO	Nick Walters
Chairman	Michael Lewis
UK	+44 1223 810 700
US	+1 844 377 2917
	www.cambridgecognition.com

Key shareholders

Directors	2.0%
Euroblue	20.9%
Octopus	14.6%
M.Buxton	14.1%
Hargreave Hale	7.8%

Next event

Apr-17	Finals
Jun-17	AGM

Analysts

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Cambridge Cognition Holdings

Mindset for growth

Cambridge Cognition is a technology company that has developed a suite of computer-based cognitive assessments to improve the understanding, diagnosis and treatment of neurological and psychological diseases. Demand for these products is increasing in the fields of drug development, academic research and occupational health. The company's integrated product offering covers every stage of drug development and it has invested in infrastructure to support an accelerated growth strategy. Despite this, the shares are rated at the lower end of an international peer group, which suggests that there is further upside potential.

- **Strategy**: Given COG's comprehensive range of validated tests, management has embarked on an accelerated growth strategy for each of its business areas: Research, Clinical trials, Healthcare. Licensing-in/acquisition of complementary tests, technologies and products has enhanced the overall offering.

- **Mental health:** Far greater attention is being paid by individuals, families, carers and employers to all aspects of cognitive function as related to health. COG has the most validated suite of cognitive tests for monitoring individuals which have a wide range of clinical applications.

- **Valuation:** Recent share price appreciation has left COG trading on a 2016 EV/sales of 2.3x. Given that it has the most comprehensive product offering, long-term experience and strong sales growth, it should trade on at least a similar rating to Cogstate, 2.8x prospective EV/sales for 2016E.

- **Risks:** COG operates in a competitive and fast moving cloud-based market which requires continual updating to ensure that the product is fresh and patient data is secure. The main business risk is the company's reliance on pharmaceutical clients' adherence to clinical trial timelines.

- **Investment summary:** Two business areas are profitable, and the third is forecast to be profitable within three years following a change of emphasis and launch of new products. Given its similar global experience and growth profile, the stock should be trading more in-line with Cogstate, suggesting that there is further upside potential.

Financial summary and valuation

Year end Dec (£000)	2013	2014	2015	2016E	2017E	2018E
Sales	4,148	5,802	5,042	6,842	8,039	10,049
Underlying EBIT	-1,989	-212	-591	166	535	1,240
Reported EBIT	-2,952	-304	-867	90	451	1,148
Underlying PBT	-2,021	-203	-591	168	538	1,242
Statutory PBT	-2,984	-295	-867	92	454	1,150
Underlying EPS (p)	-14.10	-0.49	-3.01	0.87	2.63	6.08
Statutory EPS (p)	-21.27	-1.05	-4.65	0.48	2.22	5.63
DPS (p)	0.00	0.00	0.00	0.00	0.00	0.00
Net (debt)/cash	2,261	1,519	756	1,866	2,041	2,826
Capital increases	4,413	0	78	1,139	0	0
P/E (x)	-	-	-	91.9	30.4	13.2
EV/sales (x)	3.6	2.6	3.0	2.2	1.9	1.5

Source: Hardman & Co Life Sciences Research

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Executive summary

Background

Comprehensive suite of neuropsychological tests...

...validated in >1,800 scientific publications

Cambridge Cognition has developed a suite of 25 computerised neuropsychological tests for commercialisation globally. The Cambridge Neuro-psychological Test Automated Battery (CANTAB) cognitive tests were first developed at the University of Cambridge and have evolved and been advanced over a 30 year period to the present day tests that are run on an iPad. CANTAB touchscreen multi-lingual tests have been validated extensively by over 800 academic research institutions, which has led to more than 1,800 peer-reviewed and regularly cited published papers.

2015-2016 – A period of transformation

Accelerated growth strategy...

...driven by new product launches...

...and bolt-on product acquisitions

2015 represented the beginning of a period of transformation for Cambridge Cognition. The company launched several new/updated products which makes the CANTAB cognitive test suite one of the most comprehensive on the market. To support this activity, there has been investment in infrastructure with the opening of a US sales office near Salt Lake City and a strengthened commercial team.

This transformation has continued into 2016 with further product launches and the introduction of new 'wearable' technology that can be used to track the cognitive wellbeing of individuals in real time, opening completely different markets for the company. In addition, COG recently increased its product offering through the in-licensing of DANA®, a test targeted towards rehabilitation following mental and/or psychological stress, and MANUS®, a pen for the assessment of Parkinson's disease.

Improved product offering

2015 was characterised by Cambridge Cognition updating and expanding its offering to create multi-platform solutions for its pharmaceutical and academic client base:

- **CANTAB Connect** – a cloud-based platform for use in clinical trials where cognitive testing is required; combines leading science with leading edge technology
- **CANTAB Connect Research** – up-to-date cloud-based version of CANTAB Eclipse, developed for academics needing a panel of tests to measure cognitive function
- **CANTAB Recruit** – an online platform to improve the efficiency of recruitment of patients into clinical trials, initially focused on clinical trials for patients with Alzheimer's disease
- **CANTAB Insight** – to optimise the measurement of cognition in individuals and enable better clinical decision making; can detect the earliest signs of memory impairment
- **CANTAB Mobile** – provides healthcare professionals with a sensitive screening tool for identification of the earliest signs of memory impairment in an individual and enable better clinical decision making
- **Cog Kit** – to enable tracking of everyday cognitive health and wellbeing; provides enriched real-time data collected using wearable devices for use in clinical trials and healthcare technology
- **DANA** – for the rapid, brief or long-term assessment of mental performance
- **MANUS** – a sensor pen for diagnosis and monitoring of neuromotor impairments in Parkinson's patients

Addressing the needs of customers

New products allow COG to address all stages in the drug development process

COG's core product, CANTAB Connect Research, is the gold standard suite of cognitive tests for academic research and proof-of-concept studies. However, this is only addressing one part of the development problems that a drug company faces. Addition of new products and health technology to the portfolio means that COG can assist its customers across all stages of the drug development process.

CANTAB Recruit

Greater efficiency in recruiting for clinical trials...

...improves the value proposition

This product is directed towards the logistics and efficiency of running clinical trials. It helps to identify, profile and recruit patients online that are suitable or unsuitable for a particular trial. For example, in a Phase III Alzheimer's disease trial looking to recruit 1,000 patients, up to four times this number need to be screened in order to allow for drop-outs based on exclusion criteria (e.g. age, sex) and stage of memory impairment. CANTAB Recruit can predict more accurately which patients will satisfy the inclusion criteria defined in the trial protocol, significantly improving the value proposition. In the expensive world of new drug development, every day counts.

Cog Kit/CANTAB Insight

Newly introduced mobile/wearable technology provides 'real-time' data

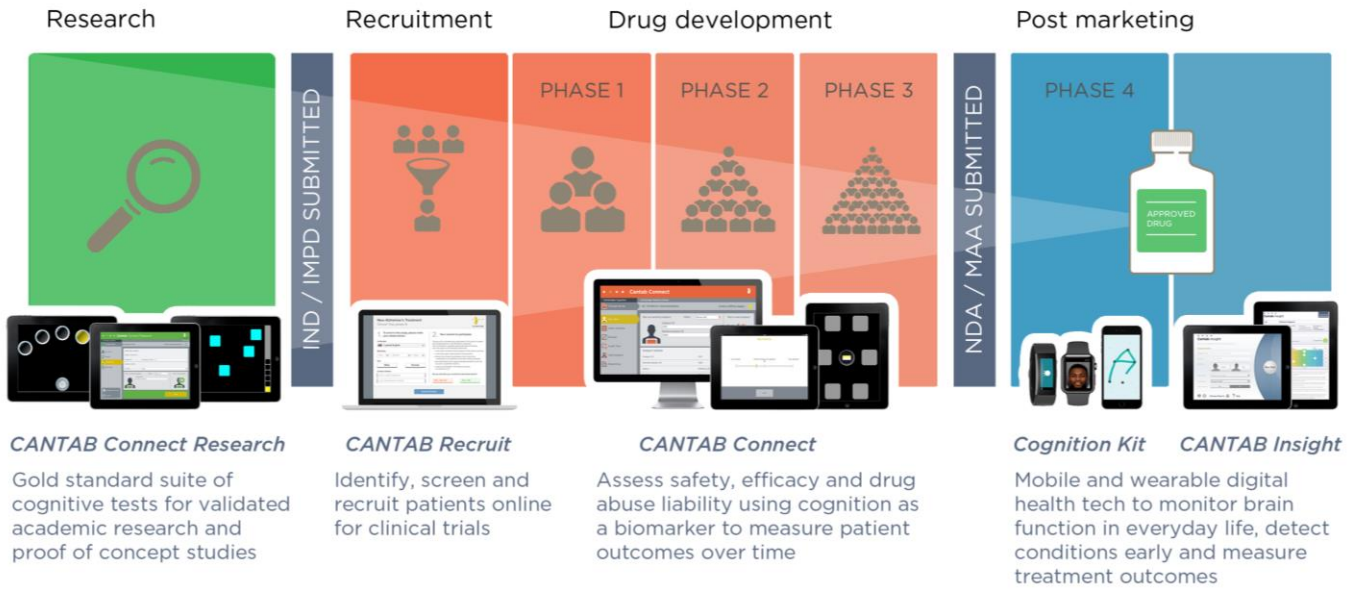
For certain conditions, the regulators are requesting increasingly 'post-marketing surveillance' studies to be performed to measure the success (or failure) of a new drug post-approval. Two of COG's more recent products address this market. Mobile and wearable health technology provides 'real-time' monitoring of brain function in everyday life of patients, providing a marked improvement in the volume and quality of data capture. This technology can detect symptoms early and can measure treatment outcomes. Being able to predict patients that are likely to respond to a drug, improves a drug's specificity and benefits the patient.

Regulatory changes

Focus on health economics under Obamacare in 2019

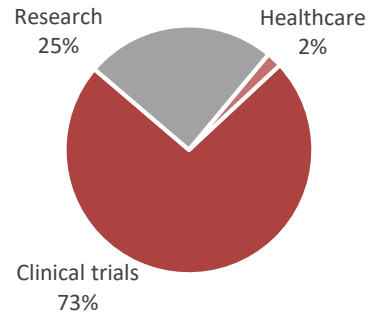
In 2019, under Obamacare, changes in the US healthcare system are being introduced. Instead of being paid for work performed, payments will be made on clinical outcomes; insurers will need results-based proof before releasing payments.

Cambridge Cognition – Complete package



Source: Cambridge Cognition; Hardman & Co Life Sciences Research

COG business areas



Sales 2016E: £6.8m

Source: Hardman & Co Life Sciences Research

Role of academics central to the validation process over many years

Healthcare is considered to be a significant growth opportunity

Business areas

Cambridge Cognition operates under three business areas. Clinical trial work offers a big opportunity, given that regulatory filings for any new drug that crosses the blood-brain barrier require safety data and analysis of potential impact on cognitive function. Given that COG has the most validated cloud-based offering, it is a very attractive partner for such work, especially with its more enhanced product range. The main downside comes from the fact that clinical trials are frequently delayed by pharmaceutical clients for a host of reasons, which might affect the timing of sales receipts by COG, as was the case in 2015 when £0.7m income was delayed into 2016.

Research is mostly the licensing of tests to academics. It is the cornerstone of the whole business and was essential for the scientific validation process. Growth is forecast to be modest (single digit), although there is increased research activity in Alzheimer's disease and dementia from which COG could benefit. Also, the original product has been upgraded recently.

Healthcare technology, encompassing clinical and occupational health, is viewed also as a major growth opportunity. The main difference with this business is that it focuses more on the cognitive performance of an individual and helps clinical decision making, and can be targeted at GPs and secondary care. Occupational health is increasingly important whether from a psychological impact (e.g. assessment of stress in soldiers in a war zone/mental capability of pilots) or linked to possible cognitive changes due to physical damage (e.g. impact sports).

Summary financial performance of COG business areas

Year to Dec (£000)		2014	2015	2016E	2017E
Clinical trials	Sales	3,926	3,395	5,008	5,558
	Profit	458	197	866	1,001
	Margin	11.7%	5.8%	17.3%	18.0%
Research	Sales	1,675	1,544	1,698	2,072
	Profit	841	303	510	642
	Margin	50.2%	19.6%	30.0%	31.0%
Healthcare	Sales	201	103	136	408
	Profit	-992	-1,102	-661	-503
	Margin	-%	-%	-171%	-123%

More comprehensive analysis is provided in the Financial Section
Source: Hardman & Co Life Sciences Research

Accelerated growth strategy

Launch of the broader product portfolio coincides with the management's decision to adopt an accelerated growth strategy for the group. The two clearly go hand-in-hand, but added to this, there has been, and will continue to be, increased investment in infrastructure.

- **Improved product range** – initially aiming to expand sales to existing customers and academic channels
- **Opening of US office** – improving exposure to the important US market
- **Increase in size and change in structure of the sales teams** – sales team expanded to provide additional coverage in the USA and continental Europe
- **CANTAB Corporate Health** – in conjunction with Shandwell Ltd, to work with employers and their healthcare providers for delivery of sensitive and accurate cognitive assessments in all relevant workplace settings
- **Product and technology acquisitions/in-licensing** – add-ons that complement COG's products offering, e.g. DANA in post-traumatic stress disorder

Funding

COG has not required large amounts of capital...

When COG was listed on AIM in 2013, the company raised ca.£5m of new capital which has been used to fund and support the company's development. The two business areas that have mostly been trading profitably and cash generative, have been used to support investment into Healthcare Technology. The main requirement for funds has been in corporate overhead and investment in infrastructure.

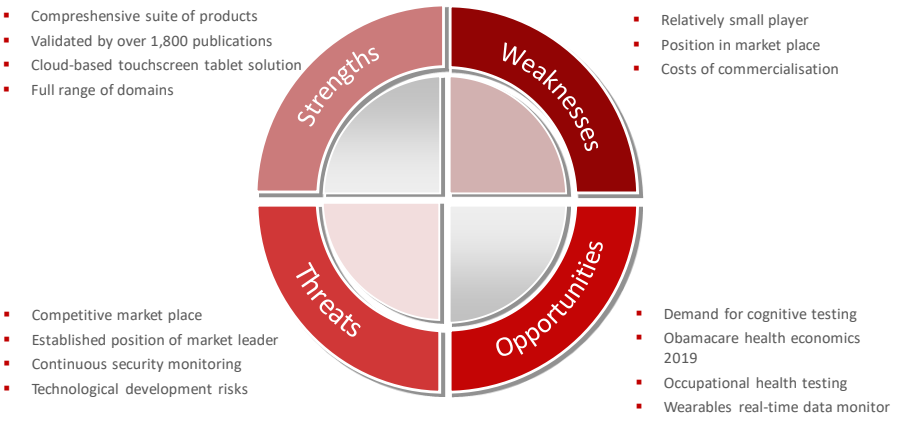
...but the £1.25m raised in April 2016 enabled implementation of the accelerated growth strategy

The Placing (3.38m shares at 37p) in April 2016 raised gross funds of £1.25m to enable a continuation of this investment to accelerate growth. Based on our forecasts, cashflow will be broadly neutral in 2017, with the company becoming cash generative in 2018 and beyond.

Management changes

Apart from commercial advances during the past 18 months, the company has also changed its management team with the appointment of Steven Powell as CEO, taking over from Nick Kerton who moved to an NED role. Steven adds many years of operational and investment experience in the Life Sciences sector and has been instrumental in promoting the accelerated growth strategy.

SWOT analysis



Conclusion: Strengths & Opportunities far outweigh the Weaknesses &Threats

Source: Hardman & Co Life Sciences Research

Valuation

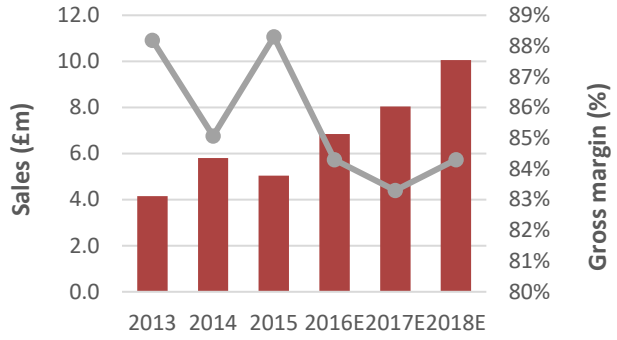
Although the stock has risen significantly in the last six months, COG is still rated below Cogstate

The problem with valuing Cambridge Cognition is that there are very few quoted comparators. Moreover, there is little evidence of M&A activity of similar companies. On page 30, a table is provided comparing COG with three quoted peers. Against all of them, it commands the lowest rating based on EV/sales, despite offering one of the best sales growth rates and being close to profitability. In our opinion, with a similar product maturity, market position and sales growth profile to Cogstate, COG should command a similar rating which would equate to a share price of 100-120p.

Investment summary

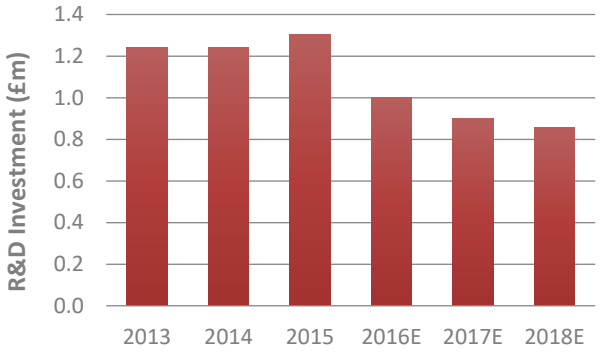
Recently announced interim results have confirmed that COG has made a strong start to the year, which has been reflected, in part, by the strong share price performance. However, COG is still rated relatively lowly compared to its quoted peers despite having relatively strong sales and profits growth prospects.

Sales & gross margin



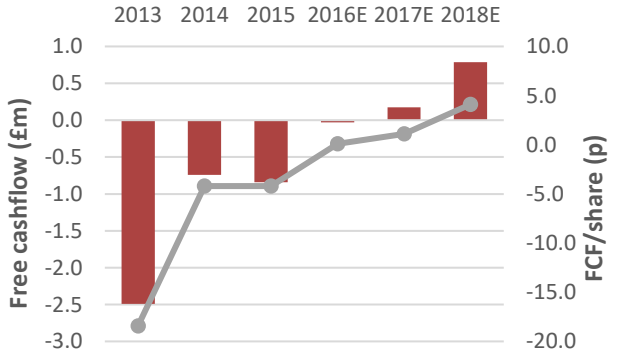
- Underlying sales growth in the region of >20% per annum
- Sales can sometimes be undermined by delays to the start of clinical trials
- Gross margins are high as they usually relate to licensing of software
- Out-sourcing of new 'wearables' hardware may cause a short term dip in gross margin

R&D investment



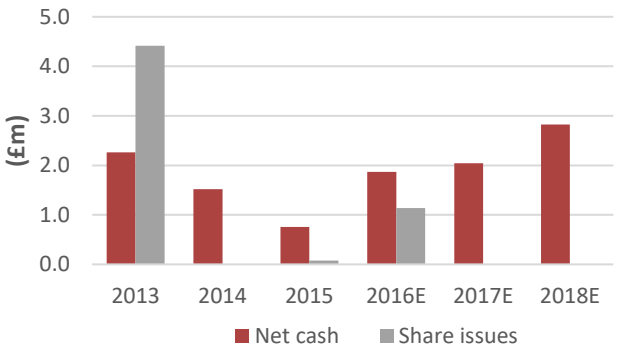
- Vast majority of development work has been undertaken over many years
- Investment R&D mostly behind the group, having peaked in fiscal 2015
- Maintenance R&D to keep the product range updated and fresh
- Maintenance R&D of technology essential to ensure the cloud platform is secure and encrypted

Free cashflow



- Historic cash burn mostly relates to corporate overhead
- Investment in Healthcare Technology has had some impact on cash requirement
- Investment in US infrastructure in 2015/16
- In absence of acquisitions, COG is expected to become cash generative going forward

Net cash/capital increases



- COG has had only two capital increases since Listing on AIM
- Recent Placing to support launch of new products, accelerated growth strategy and investment in infrastructure
- Cash position improves as Healthcare Technology moves into profit
- No debt in the group

Source: Company data; Hardman & Co Life Sciences Research

CANTAB technology

CANTAB originated within the University of Cambridge...

The COG group of companies has developed a suite of ca.25 computerised neuro-psychological tests for global commercialisation. The Cambridge Neuropsychological Test Automated Battery (CANTAB) of tests were developed by Professors Trevor Robbins and Barbara Sahakian from the Department of Neuropharmacology at the University of Cambridge and have evolved and been advanced over a 30 year period to the present day tests, that are run on an iPad off a cloud-based data platform. The principal aim of the tests is to assess central nervous system (CNS) disorders and cognitive function and relate back to specific areas of brain activity, thereby investigating memory, attention, decision making and social interaction.

With considerable academic support...

...and validated by >1,800 peer-reviewed scientific publications

CANTAB touchscreen multi-lingual tests have been validated extensively by over 800 research institutions which has led to more than 1,800 peer-reviewed and regularly cited published papers. This broad, independent, international scientific verification has facilitated their use in clinical trials for the assessment of new drugs on cognitive end-points relating to efficacy and toxicity.

New US base opened at Salt Lake City

The company operates three business areas from its HQ in Cambridge and at its US base just outside Salt Lake City.

Cambridge Cognition business units

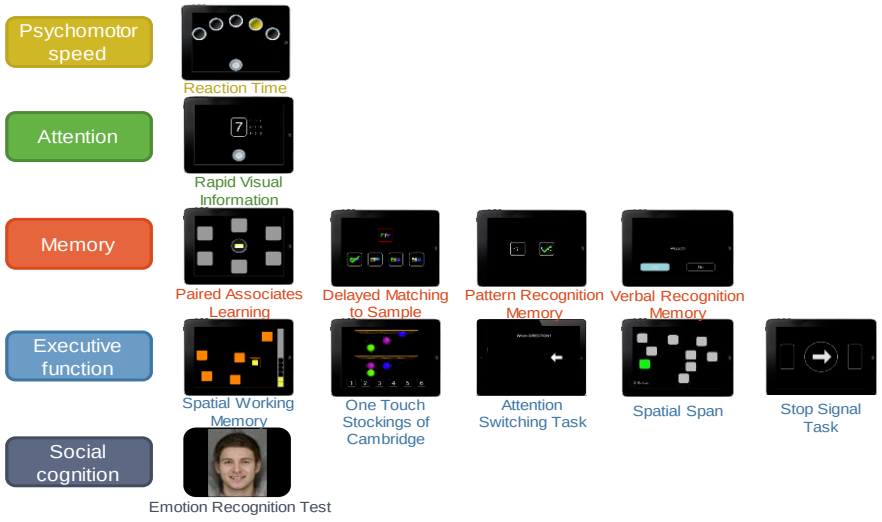
Business area	Focus	Products
Research	Research products Academic resources Training	CANTAB Connect Research
Clinical Trials (Pre- & post-approval)	Drug efficacy Drug safety & tolerability	CANTAB Connect CANTAB Recruit Cognition Kit
Healthcare Technology	Mental well-being Occupational health	CANTAB Mobile CANTAB Insight

Source: Company reports

Different combinations of tests cover disparate cognitive activities

Although Cambridge Cognition has a bank of about 25 tests, different combinations are used to cover five disparate cognitive domains.

CANTAB cognitive tests



Source: Cambridge Cognition

Research

Academic research has, and still does, play a very important role

The full complement of CANTAB tests is available for academics to measure accurately all aspects of cognitive function via the CANTAB Research Connect platform, which is a true two-way cloud-based platform. These tests are available in return for an annual licence fee, although academic institutions will not necessarily want access to every test.

Tests are simple...

...but sensitive

In general, the CANTAB tests are simple to run, sensitive, and easy to administer, taking on average about 5-10 minutes to perform. These tests tend to be centred around group analysis. They have high sensitivity to small changes in brain function over a long period of time, which can be done by following the same individual chronologically over many years.

Cognitive Research

Tests	No.	Example	Uses
Memory	8	Spatial working memory	Alzheimer's; Autism
Attention	6	Attention switching task	Traumatic brain injury
Executive function	7	Spatial span	Huntington's chorea
Decision making	3	Cambridge Gambling task	Alcoholism; drug abuse
Social cognition	1	Emotion recognition task	Depression; schizophrenia
Induction	2	Motor screening task	Speed & accuracy of response
Questionnaires	1	Visual analogue scales	Effect of drugs

Source: Company reports

CANTAB Research suite

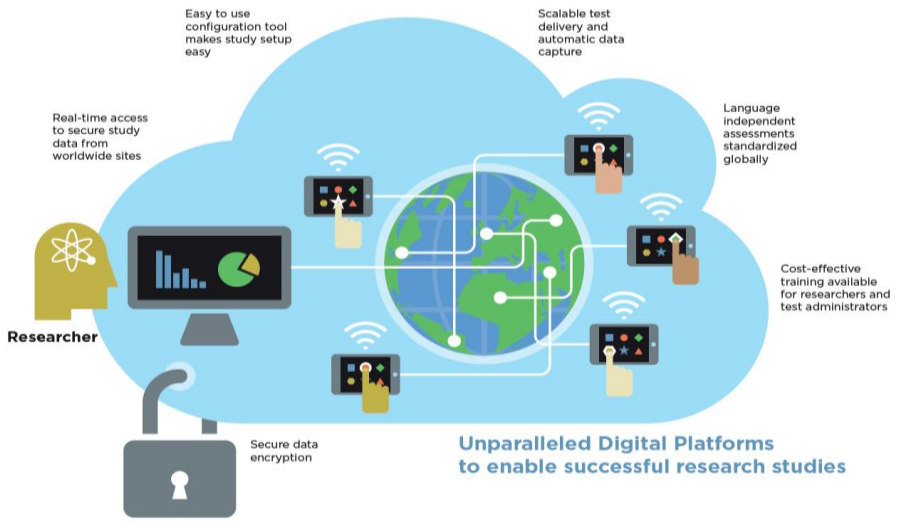
ADHD
Alzheimer's disease
Autism
Cerebrovascular
Depression
Down's syndrome
Epilepsy
Huntington's chorea
Parkinson's disease
Neuromuscular
Multiple sclerosis
Schizophrenia
Traumatic brain injury

Source: Cambridge Cognition

CANTAB Connect Research

CANTAB Connect Research is a more up-to-date cloud-based version of CANTAB Eclipse, which was developed for researchers needing a panel of tests to measure cognitive function. It is important to note that it is not a psychometric or 'intelligence' test. These functional tests provide an assessment of memory and speed of analysis. When deciding which test to use, the researcher needs to consider the population to be tested, the age group, and how often the test needs to be performed etc.

CANTAB Connect Research



Source: Cambridge Cognition

Analysis of brain function over time

Sports regulators are increasingly recognising importance of brain monitoring

This field of interest is very topical at the present time, as an important use could be the effect of sport on cognition. This is particularly relevant in contact sports, e.g. boxing and rugby. For example, the following questions have all been in the news recently:

- Was the development of Parkinson's Disease by Mohammed Ali linked to the frequency and number of punches taken to the head during his boxing career?
- How does concussion in rugby players impact on cognitive function over time? Does repeated incidence of concussion produce a pronounced impairment of function?
- Does the constant heading of a football impact brain function? Interestingly, none of the global football authorities (FIFA, UEFA, FA) have mechanisms in place for monitoring such conditions

Academic community

Over a 30 year period, the CANTAB test suite has become the world's most validated cognitive testing platform. It has been used by over 800 of the top global research institutions leading to the publication of over 1,800 peer-reviewed publications. In itself, it has created a CANTAB community whereby researchers have access to customer support (from the company), science consultancy, and customer forums for discussion and training materials. Also, CANTAB Insight provides researchers with assistance, guides and support materials for grant and funding applications.

Clinical Trials

CANTAB tests can be used in Phases I-III of clinical trials to accelerate the development of new drugs, and in Phase IV to perform post-marketing surveillance studies if required by the drug regulators as part of the approval process. They are used to assess the safety and efficacy of drugs in mental health. This is the largest and fastest growing part of COG's business.

Cognitive safety

CANTAB tests address all stages of drug development process...

...from pre-clinical activity through to post marketing surveillance

CANTAB tests can be used to accurately assess the cognitive safety and tolerability of drugs throughout clinical development and post approval. Much of this is driven by the requirements of the regulators. Any drug that crosses the blood-brain barrier has the potential to affect brain function and cause cognitive impairment. CANTAB tests are used by drug companies to:

- **Reduce risk** – Detect and monitor cognitive signals during all phases of clinical development and marketing
- **Regulatory compliance** – NDAs containing cognitive safety studies have more credibility with the regulators
- **Decision making** – Understanding cognitive signals allows informed decisions to be made during the clinical trial process
- **Pharmacovigilance** – Favourable cognitive safety profiles can be used to boost claims in marketing literature

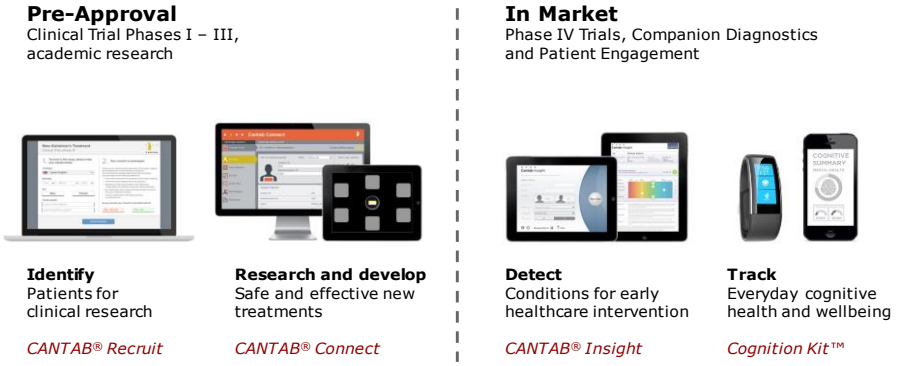
Clinical trial offering

Clinical trial work highlights the flexibility of COG's suite of tests

The selective and specific use of CANTAB tests can be highlighted by the differential use of tests required in drug development. For example, different outcomes are sought for a drug under development for Alzheimer's disease compared to those for a cardiovascular drug that might cause memory impairment, if it is known to cross the blood-brain barrier. The need to know such outcomes is very much being driven by the regulators.

The CANTAB offering for clinical trials is not uniform across all Phases, the tests being tailored to each phase of development and the type of drug being tested.

CANTAB Clinical Trial offering

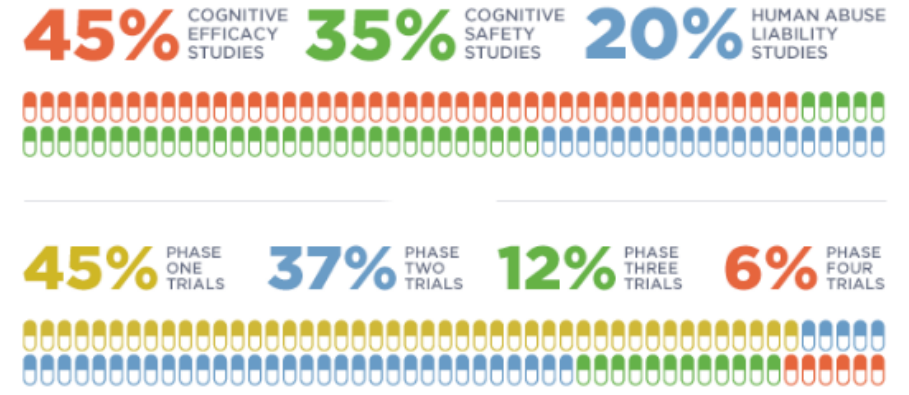


Source: Cambridge Cognition

Long history of test validation

Pharmaceutical and biotech companies are reassured by the long validation history of cognitive assessment and the comprehensive publications and citations on the subject using CANTAB tests. In a competitive market, this is a clear differentiator when deciding whose tests should be used. To date, CANTAB tests have been used in over 160 clinical trials performed by 30 well-known drug companies.

Clinical trial experience



Source: Cambridge Cognition

CANTAB offering

CANTAB Recruit is one of COG's latest products

Cambridge Cognition's offering for clinical trials is essentially marketed under two brands – CANTAB Recruit and CANTAB Connect. CANTAB Recruit is expected to help identify and recruit suitable patients for a particular clinical trial. CANTAB Connect allows drug development companies, in conjunction with their selected Clinical Research Organisation (CRO), to select and perform the relevant tests to be included in the clinical trial that are appropriate to the type of drug being developed.

CANTAB Recruit

Improving efficiency of patient recruitment saves time and money

Earlier this year, Cambridge Cognition launched a web-based product, CANTAB Recruit, which is an online portal for the recruitment of patients into clinical trials. The aim of this product is to recruit suitable patients into clinical trials at an earlier stage, thereby improving efficiency by lowering the high number of patients that fail the traditional screening procedures. Such a product is considered to be particularly useful in identifying suitable patients for trials, e.g. Alzheimer's. This has the potential to save an enormous amount of time and money.

Presently, patients recruited into clinical trials are initially selected following a subjective assessment by a doctor. People thought to have early signs of Alzheimer's disease then undergo either/both lumbar puncture and brain scans, both of which are expensive procedures, to identify positive biomarkers of the disease. Despite this, the failure rate in initial recruitment screening remains relatively high. Therefore, a simple pre-screen using a CANTAB test prior to biomarker testing could be very beneficial.

Patient recruitment is estimated to absorb 32% of overall trial costs

Patient recruitment is estimated to account for 32% of total trial costs[1] and 80% of trials are delayed by at least one month because of unfulfilled patient recruitment[2], which has a knock-on effect on reporting of study results. CANTAB Recruit can be used to increase the efficiency of recruitment into clinical programmes by pre-screening patients first. This is forecast to reduce the number of people needed to enter full screening procedures in order to recruit the number stated in the clinical trial protocol. This product is also attractive because it can be completed at home.

CANTAB Connect

Multiple tests by multiple users simultaneously…

CANTAB Connect provides a secure platform with encrypted data in a private cloud environment. In clinical trials, at any one time, there might be multiple users on multiple devices. CANTAB Connect allows multiple device access in real time. Being cloud based, should the need for a software update arise, this can be performed automatically at every site using the platform the next time that the programme is accessed. Therefore, amalgamating science coupled with leading edge technology.

CANTAB Connect has a number of attractions for pharmaceutical companies wishing to use it in their clinical trials:

- **Flexibility** – Easy to use, portable, multiple devices
- **Efficiency** – Automated test delivery, electronic data capture, instant scoring
- **Speed** – Instant data capture with real-time data from any site in the world
- **Security** – Encrypted data and secure cloud-based back-up
- **Quality** – Completely clean reliable data from the outset

…with 'real time' monitoring via wearable technology

As part of its current offering, Cambridge Cognition has developed wearable technology to enable tracking of everyday mental health and wellbeing. The attraction of this technology to those undertaking clinical trials is that it can obtain data from more people, the data is richer and more comprehensive, and subjects can be tested chronologically multiple times during the course of the trial. This is of particular interest where regulators have requested Phase IV post-marketing surveillance, as it can all be performed in the community/home.

[1] Patient Recruitment and Clinical Vendor Fees Top Clinical Trial Cost Drivers. Cutting Edge Info.
[2] Beasley D. (2006). Recruiting Special Patient Populations. Applied Clinical Trials.

CANTAB Connect technology

Computerized testing
Non-verbal computerized delivery and standardized administration reduces rater variance and supports scalable studies.

Touchscreen assessment
Simple to administer and easy to use saving time and cost before, during and after trials.

Electronic data capture
Automated scoring minimizes rater time, reduces data errors and maximizes data accuracy.

Real-time data access
Ongoing data vigilance and query management further enhances data quality.

Digital information systems
Our platforms enable rapid study set-up, seamless remote testing and secure data encryption on validated hardware.

Source: Cambridge Cognition

Healthcare

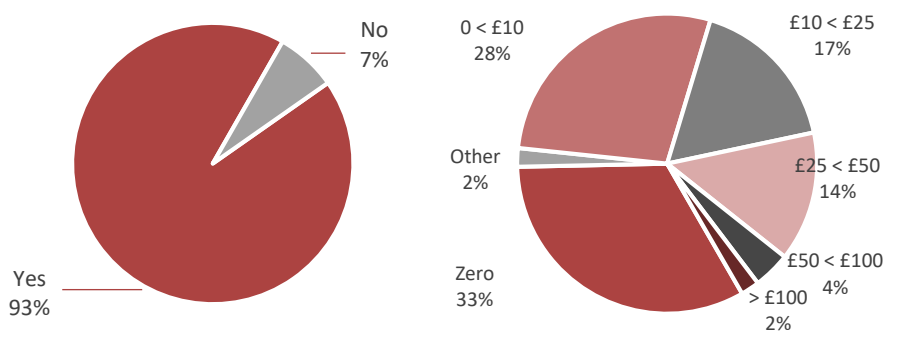
Mental wellbeing is of global interest...

Mental wellbeing is a major economic burden throughout the world and it is estimated that about 1-in-4 of the global population will suffer from a mental health problem. Historically, mental health was considered a stigma. However, as overall health has improved and average life expectancy has increased, so the attitude towards mental health has changed, with less stigmatism today. Most people, and their families/carers, want to know about the mental state of individuals and are willing increasingly to pay for this information, provided that it can be performed sensitively.

...and something that people are prepared to pay for

In surveys, most subjects indicated that they would be willing to take a test at home or in the presence of their GP, and that the average price that these people appeared willing to pay was £27.50.

Testing mental wellbeing survey



Willingness to pay | **Price prepared to pay**

Source: Cambridge Cognition

Healthcare focuses on an individual's performance

Products in the Healthcare business segment focus on an individual compared to the Research products which focus on group performance. As such they are targeted at different markets:

- **Alzheimer's/dementia** – Early diagnosis by GPs so that appropriate treatment and care can be provided
- **Occupational Health** – Can be used to assess mental health and well-being in employees in responsible jobs (e.g. pilots), or the impact of post-traumatic stress disorder (e.g. war veterans)
- **Concussion** – Ongoing impact of single and multiple concussion on long-term mental health

COG's products are targeted at the regulated market as a Class II medical device

While there is clear demand for a retail product, the focus of attention of Cambridge Cognition in the near term, is in the healthcare setting where the CANTAB products can assist in the clinical decision making process. This also takes advantage of the fact that COG's offering in this space are differentiated from the weaker retail offering by being classed as Class II medical devices with CE Mark (510(k) filed).

CANTAB Mobile

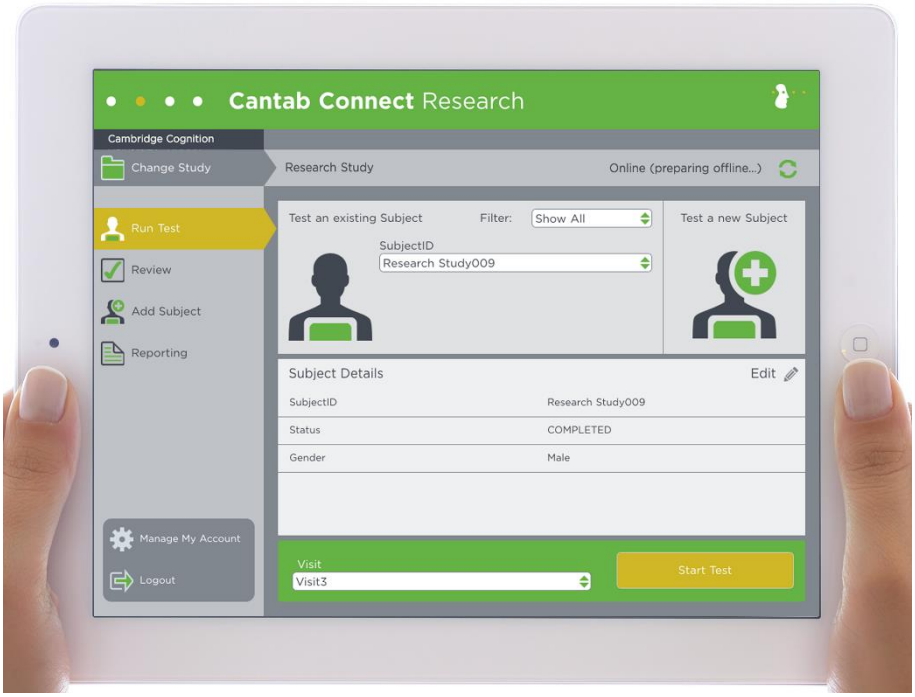
Early indication of Alzheimer's disease...

CANTAB Mobile provides healthcare professionals with a sensitive screening tool for the identification of the earliest signs of memory impairment that is indicative of the early stages of Alzheimer's disease.

...through a simple touchscreen test that takes 10 minutes

CANTAB Mobile assesses the performance of specific brain regions that are known to be the affected first in Alzheimer's disease. It is a simple, objective touchscreen test performed in 10 minutes on an iPad that takes into consideration the subjects' age, gender and education and automatically provides an instant and accurate outcome report.

CANTAB Mobile



Source: Cambridge Cognition

Cognition test comparison				
Product	**6CIT**	**GPCOG**	**MMSE**	**CANTAB Mobile**
Test format	Paper & Pencil	Paper & Pencil	Paper & Pencil	Touchscreen
Resource needed	Trained professional	Trained professional	Trained professional	Anybody
Dementia sensitivity	**Moderate** 79% sensitivity 92% specificity	**Moderate to high** 85% sensitivity 86% specificity	**Moderate to high** 88% sensitivity 86% specificity	**High** 100% sensitivity 92% specificity
Mild cognitive impairment (MCI) sensitivity	Not reported	Not reported	Low	**Moderate to high** 83% sensitivity 82% specificity
Depression sensitivity	Low	Low	Low	**High**
Sensitivity to patient's age, gender, education	Clinician subjectivity	Clinician subjectivity	Clinician subjectivity	Automated vs normal data
Results reporting	Manually scored	Manually scored	Manually scored	Automatic & instantly reported

Source: Cambridge Cognition; Hardman & Co Life Sciences Research

CANTAB Insight

Optimising measurement of cognition...

Cognition is the mental process of acquiring knowledge including various aspects such as awareness, perception, reasoning and judgement. Therefore, cognitive health affects everybody, every day of their lives. When mental health is impaired, it can impact everyday living by affecting performance, judgement and decision making. The aim of CANTAB Insight is to optimise the measurement of cognition to enable better decision making.

...with an in-built assessment of current mood

CANTAB Insight is a standardised test panel that comprises a validated set of assessments with proven sensitivity for measuring five cognitive domains. The tests take account of individuality and allow for age. Subjects continue each test until they get the answer right, however there is an in-built mechanism to move on once the limit of the patient is judged to have been reached. There is also an in-built depression scale to provide an assessment of the current mood of the subject taking the test.

CANTAB Insight output

Source: Cambridge Cognition

The small battery of tests takes approximately 20 minutes to complete and a report is produced instantly and automatically.

- **Executive function** – Central control, planning strategy and flexible thinking
- **Processing speed** – Ability to process information/tasks fast & effectively
- **Attention** – Ability to concentrate and actively process information
- **Working memory** – Holding & processing information – important for reasoning, comprehension & learning
- **Episodic memory** – Memory of events and experiences that can be readily recalled

Additional acquired technologies

COG looking to acquire/in-license complementary tests/technologies

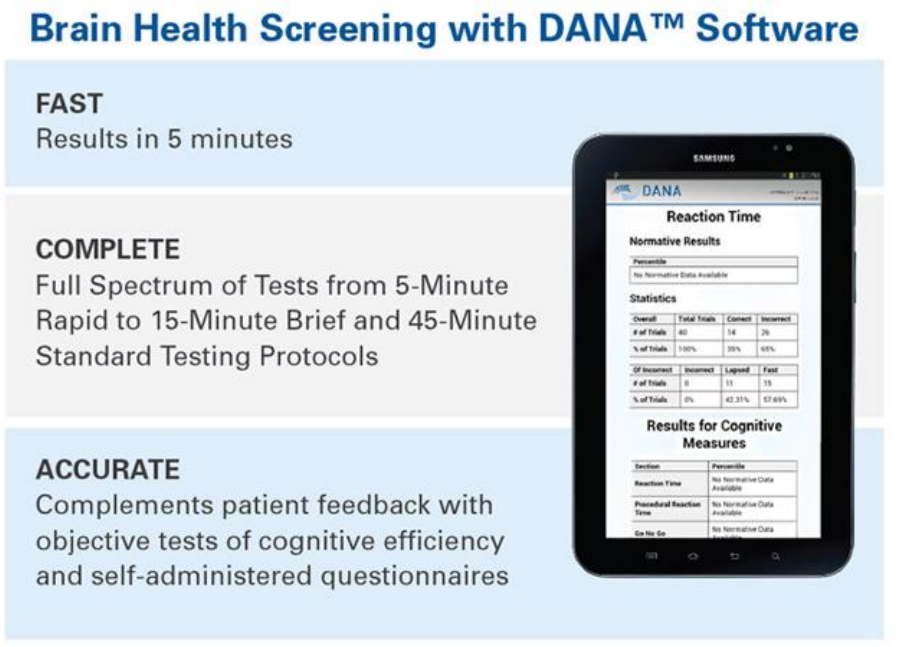
In June 2016, Cambridge Cognition announced a distribution agreement with AnthroTronix, a privately owned US engineering research and development company. AnthroTronix combines industry knowledge with innovation to develop research-based software and hardware products for mobile computing platforms and robotic systems for the advancement of human health, in the fields of communication, education, and defence. COG has acquired global re-seller rights to the brain health assessment product, DANA®, but not for military and occupational health use in the US.

DANA®

DANA was designed for assessment of US military personnel

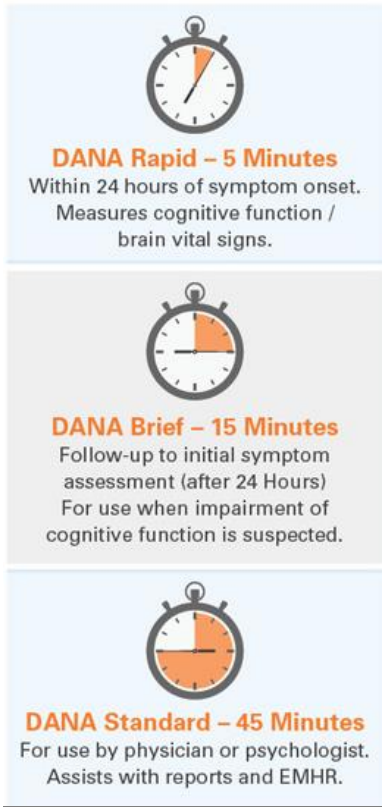
AnthroTronix developed the Defense Automated Neurobehavioural Assessment (DANA) for the US Department of Defense in 2010, to evaluate military personnel for degradation of mental performance due to injury from explosions and environmental factors. DANA has 510(k) approval and provides a fast and accurate screen for changes in neurobehavioral and cognitive function.

DANA health screen



Source: AnthroTronix

DANA summary



Source: AnthroTronix

Unlike all of COG's existing products, DANA runs on Android operating systems, opening the company up to mobile devices and tablets. The DANA tool was developed for use in a variety of settings and comes in three formats:

- **DANA Rapid** – 5 minute test for assessment in emergency setting
- **DANA Brief** – 15 minute test for deeper analysis of issues that could lead to mental degradation
- **DANA Standard** – 45 minute test for comprehensive and long-term analysis

Although DANA was developed originally to provide an in-the-field assessment of the impact of war on US military, this product clearly has uses in occupational health to determine whether a staff member is fit for duty or in need of additional care. As such, this product is complementary to COG's current offering.

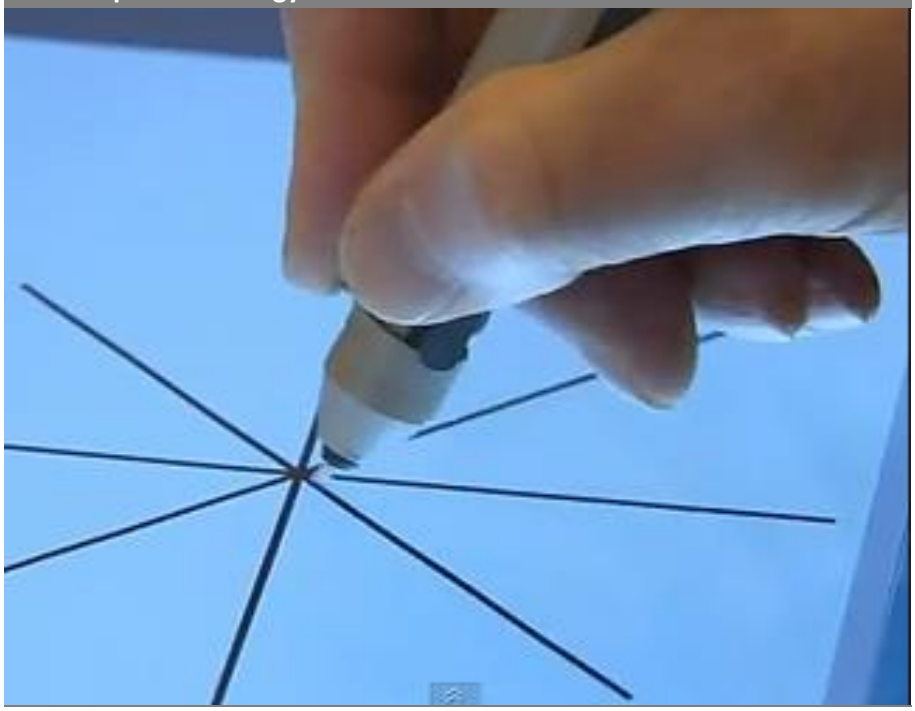
COG will market DANA as part of its overall offering immediately in the US, but will apply for CE Mark for EU markets which is expected to be approved in 4Q 2016.

MANUS® Pen

Also in June 2016, Cambridge Cognition announced a distribution agreement with MANUS Neurodynamica for exclusive rights to market MANUS Pen, a sensory pen technology to assist in the non-invasive diagnosis and monitoring of Parkinson's disease. This Class I medical device records and analyses hand and limb motion to assess whether a person has any underlying neuromotor impairment, a common feature of Parkinson's disease.

MANUS helps in diagnosis and monitoring of Parkinson's disease

MANUS pen technology



Source: MANUS Neurodynamica

Parkinson's disease affects the fine motor control of the fingers and the gross movement of upper limbs. Traditionally, in the assessment of tremor, hand writing tests are performed together with a subjective assessment in the clinic. By recording minute motions through motion and pressure sensors, the MANUS Pen provides clinicians with an objective assessment of neuromotor performance.

An estimated seven to 10 million people worldwide are living with Parkinson's disease and this figure is forecast to double over the next 25 years[3], with an enormous associated direct and indirect cost burden on healthcare systems[4].

Launch is expected by the end of 2016

The MANUS Pen is currently undergoing final product and software enhancements and COG expects to begin marketing this device in the final quarter of 2016. The company will adopt a similar approach to that used successfully with its cognitive tests, initially focusing on academics to undertake research with the product and providing further validation through peer-reviewed scientific publications. Then it will focus on healthcare professionals.

[3] Kowal, S. L., Dall, T. M., Chakrabarti, R., Storm, M. V. and Jain, A. (2013), The current and projected economic burden of Parkinson's disease in the United States. Mov. Disord., 28: 311-318.
[4] Parkinson's Disease Foundation. Statistics on Parkinson's 2016.

Focus on mental health

- Mental health is not simply the absence of mental disorders
- Mental health is an integral part of overall heath
- Mental health is determined by a range of socio-economic, biological and environmental factors

View from the World Health Organisation

Mental wellbeing is not simply about mental disorders or disabilities

The WHO constitution states that: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." An important implication of this definition is that mental health is more than just the absence of mental disorders or disabilities[5].

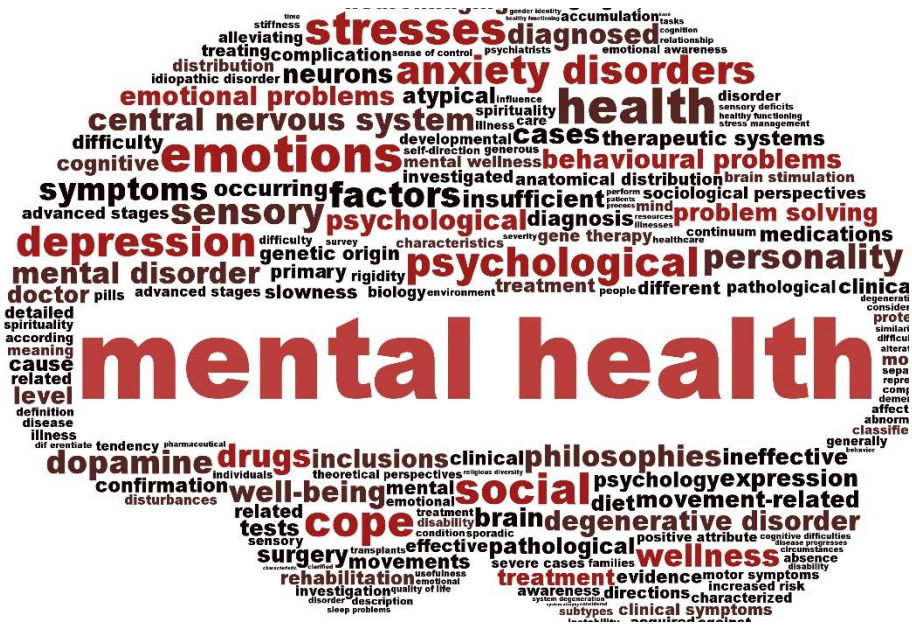
Mental health is a state of well-being in which an individual person realises his or her own capabilities, is able to cope with the normal stresses and strains of everyday life, can work productively and is able to make a contribution to his or her community.

Mental health and well-being are fundamental to our collective and individual ability as humans to think, show emotion, interact with one another, earn a living and enjoy life. On this basis, the promotion, protection and restoration of mental health can be regarded as a vital concern of individuals, communities and societies throughout the world.

Socio-economic pressures are recognised risks

Multiple social, psychological and biological factors determine the level of mental health of a person at any point in time. Persistent socio-economic pressures are recognised risks, with the clearest evidence associated with indicators of poverty and low levels of education.

Graph title



Source: https://thoughtsforthursday.files.wordpress.com/2015/01/mental-illness-7.jpg

[5] World Health Organisation – Factsheet on mental health – April 2016

Incidence

The prevalence of mental health problems was highlighted in an ITV report in 2015[6].

- WHO estimates about 450 million people globally are affected by mental issues
- The ONS has estimated that 1:10 children aged 5-16 have a clinically diagnosed mental health problem each year
- 1-in-4 British adults are diagnosed with at least one mental health problem each year; although the US Department of Health & Human Services put it at 1-in-5

Incidence of mental health in the US

Source: US Department of Health & Human Services

Traumatic brain injury

Very topical issue in sports

The impact of sports on mental health is a very topical issue. The discovery that an unusually high proportion of the England football team that won the 1966 World Cup have poor mental health has raised the question about whether the constant heading of a football is damaging to long-term health. Surprisingly, the Football Association has not embraced the concept in any way nor has it ever commissioned any studies to investigate the long-term impact of playing football on mental health.

Other sports in which long-term mental health might be affected include Boxing and Rugby. We learned recently of the death of Muhammed Ali at the relatively young age of 74. Undoubtedly a boxing legend, and with incredibly fast manoeuvrability which enabled him to avoid many punches, he still developed Parkinson's Disease at a young age, and has been in poor mental health for two decades.

In contrast, over the last 24 months, World Rugby has embraced mental health and any player concussed during a match is automatically prevented from playing again for two weeks[7]. The availability of simple to use, cloud-based tests could be the first step in the sports regulatory bodies recognising the long-term implications on mental health.

[6] http://www.itv.com/news/2015-07-27/mental-health-what-you-need-to-know/
[7] http://www.englandrugby.com/my-rugby/players/player-health/concussion-headcase/coaches

Market opportunity

The market is very fragmented and difficult to assess...

Assessing the market opportunity for COG's range of tests is extremely difficult. On the one hand, SharpBrains[8] analysed in some detail 52 companies including Cambridge Cognition and concluded that the market for brain training and cognitive assessment was valued at $1.3bn in 2013. A subsequent report by Markets and Markets[9], again featuring Cambridge Cognition, concluded that the "Cognitive Assessment and Training Market" was worth $2.4bn in 2015 and was forecasting that it would rise to $7.5bn in 2020. However, these reports are taking a much wider perspective of the 'whole' market including intelligence tests for education and employment purposes, compared to the specific healthcare-orientated tests of activities of Cambridge Cognition.

...but many $bn are spent on cognitive testing annually

Assessment type

- Pen-and-paper tests
- Hosted psychometric/intelligence tests
- Biometric tests

Service type

- Consulting services
- Training & support services
- Educational learning
- Brain training
- Corporate learning and assessment

Vertical

- Healthcare
- Education
- Corporate
- Sports
- Defence

Conclusion

Many of COG's immediate competitors are private companies...

The major providers in the cognitive assessment and training field that compete with Cambridge Cognition are considered to be Cogstate, Pearson Assessments, Bracket Global, Brain Resource and Cognifit. From an analytical view, the dilemma is that most of these companies are either privately-owned with limited publicly available financial information, or part of much larger organisations where the financial information is included within the sales of a much larger division. However, given the sales growth rates just reported by Cogstate for fiscal 2016 (+49%) and expected for COG (+40%), we conclude that there is a significant market for these tests, currently worth an estimated $150m and growing rapidly, as the drug regulators and Obamacare increasingly seek greater proof of safety and economic healthcare benefit respectively.

...Cogstate is the nearest direct competitor that is also quoted

[8] www.sharpbrains.com
[9] www.marketsandmarkets.com

Competitive landscape

There are many products available that offer tests of brain function with a wide price range. Some fall into the budget category to be run on mobiles, tablets or computers, such as brain training games. Next come the established pencil and paper cognitive assessment tests and classic neuropsychology tests.

Traditional competitor products

Test	Advantages	Disadvantages
Pencil & paper test e.g. Mini mental state exam (MMSE) Montreal cognitive assessment (MoCA)	Quick Inexpensive	Subjective Trained neuropsychologist Administration time Manual scoring
Specialist neuropsychological tests	Scientifically validated Comprehensive assessment Normal data available	Expensive Complex & time consuming Subject to scoring errors Needs qualified personnel

Source: Cambridge Cognition Admission document, Hardman & Co Life Sciences Research

Today, however, there are modern up-to-date, user-friendly, cognitive function tests that are run specifically on tablets or computers. These latter tests are similar in objectivity to the offering from Cambridge Cognition and provide the main competition. They are generally well validated scientifically, target the same domains and the same business areas. Moreover, if they are to be used in clinical trials and regulatory submissions, they must have regulatory approval via CE Mark (EU) of 510(k) (US).

Cogstate

Established market leader for traditional paper-based tests...

The biggest and closest competitor to Cambridge Cognition is Cogstate, an Australian-based company with global operations. This company has the advantage of being the established market-leader for paper-based cognitive tests. However, it has used this knowledge and position to create computer-based tests which target the same areas of metal wellbeing. Apart from the tests themselves, Cogstate also competes on the same business fronts: clinical trials, academic research, healthcare and sports medicine.

...that has also developed computer-based tests...

Cogstate employs a battery of individual tests that use visual and verbal stimuli to ensure assessment is culture-neutral and not limited by a subject or participant's level of education. The battery of tests can be customised to its client's requirements. They are all designed for repeated administration with minimal practice or learning effects.

Although Cogstate is undoubtedly the established market leader which gives it some advantages, there are also some disadvantages to its offering compared to Cambridge Cognition. First, it runs only on computers running Windows (although a tablet version is in late-stage development). Secondly, its software needs to be loaded manually onto each computer and any updates also need to be installed manually. Thirdly, and this is a personal view, while the COG website is very crisp and modern, that of Cogstate appears to be very outdated and old fashioned.

...good relationships in place with major drug companies

Cogstate's biggest customers include Johnson & Johnson ($4.9m of fiscal 2016 sales) and Lilly ($4.7m).

Screen Inc

A direct competitor...

The main offering from Screen is Computer-Administered Neuropsychological Screen for Mild Cognitive Impairment (CANS-MCI), which is a computerised cognitive test designed to detect cognitive changes most commonly associated with an active progression towards Alzheimer's disease.

...but with a limited offering

The CANS-MCI can also be used as an early detection test for a variety of other conditions such as drug and alcohol abuse, concussion, cancer (e.g. "chemobrain"), multiple sclerosis, lupus and Parkinson's disease. The test can also be used to establish a baseline activity before surgery, for sports, or many age-related conditions.

The test takes about 30 minutes to perform and has three main areas of focus:

- Memory
- Language/Symbol fluency
- Processing speed/Executive functions

CNS Vital Signs

Products targeted more at clinicians

CNS Vital Signs has designed and developed neurocognitive and behavioural assessment tools and technologies for use by clinicians and researchers largely targeted at clinical trials and academic research. The approach taken by CNS Vital Signs is based on LIFESPAN which is a collection of normative neurocognitive data from ages 8 to 89, to provide comparative results. Clinicians grade the level of neurocognitive impairment against the normative comparison to rule-in or rule-out certain clinical conditions and/or determine the level of impairment.

CNS Vital Signs in-office cognitive testing procedure is a computer-based test to efficiently and objectively assess a broad spectrum of brain function performance or domains under challenge (cognition stress test). However, the need for keyboard responses could affect accuracy and timing.

Deployment in the care continuum

Source: CNS Vital Signs

Bracket Global

Major focus on clinical trials...

Bracket represents a significant competitor in the clinical trial arena. The company has seven offices and over 500 employees worldwide, dedicated to helping drug companies and contract research organizations increase the strength of their clinical research data. Bracket eCOA™ is a flexible platform for electronic clinical outcomes assessments that collects information from patients (ePRO), clinicians (eClinRO) and other observers for the life sciences industry. The strength of the product is that it has been used in over 1,200 clinical trials looking at 50 indications.

...and at the forefront of technology

Bracket Patient Diary® is the Company's latest version of a native, downloadable application for patients participating in clinical trials, allowing patients to report symptoms and complete diaries using a secure app installed on their own smartphone. Bracket RTSM®, is an industry-first native app for managing clinical supplies and randomisation of patients into clinical trials. Bracket Analytics® is a stand-alone tool that provides study managers and sponsors a dashboard of their clinical trial progress. Bracket Diary, Bracket RTSM, and Bracket Analytics are all available for use on iOS and Android smartphones.

Bracket products

Source: Bracket Global

NeuroTrax

Broad cloud-based application...

The main product of NeuroTrax is BrainCare® which is a cloud-based computer application for measuring and promoting brain fitness. BrainCare applies a battery of tests, which map patient capabilities and results across six cognitive areas: Memory, Executive function, Attention, Visual spatial, Verbal function, Problem solving and Working memory

BrainCare assesses the client's brain wellness by measuring precisely a subject's performance in a series of interactive tests – measuring both accuracy and response time. Test results are compared to previous data obtained from the same patient and performance data from a "normative" peer group (age, sex, education). The result is a profile of cognitive areas that are considered to be 'strong' and those that are relatively 'weak'. The latter being the targets for exercises that can be done at home.

...but tests take longer to perform

BrainCare testing is very user-friendly and performed on a computer. Testing times are long, typically in the range 45-60 minutes, largely dependent on the patient's age.

BrainBaseline

A more personalised approach

BrainBaseline is a relatively new player on the market. This product offers a measure of how well your brain is working compared to similar (normalised) people. Genetic and demographic factors together with mental and physical health are all interconnected. BrainBaseline claims that its product takes into account 'who you are' and provides a personalised picture.

BrainBaseline has a modern website and its product is run on tablets. However, given that it is a relatively new player, it does not have the detailed validation data that Cogstate and Cambridge Cognition has and, therefore, its tests are targeted very much at academic research at present.

Interim results & business update

Key features

- **Sales** – Sales grew +11.3% to £3.3m which was slightly better than our forecast (£3.2m), largely driven by the +15.8% growth in 'Software & Services' for the clinical trials business
- **Gross margin** – COGS were significantly higher than expected at -£0.57m, which was almost the same as for the whole of 2015. Part of the explanation is that there were some hardware sales which are at lower margins. Therefore, the gross margin fell from 88.1% to 82.7%
- **R&D spend** (undisclosed) – We believe that R&D spend peaked in fiscal 2015 in the run up to new product launches and was reduced to about £0.5m (£0.63m), which has a direct impact on reported administration costs
- **SG&A** – There was an underlying increase in marketing spend due to the investment in marketing headcount and associated recruitment costs. While the recruitment costs will not be repeated in 2H'16, there will be a full six month contribution from the increased headcount
- **Administration costs** – Overall these were lower than expected, falling -3.4% to £2.9m (-£3.0m). The rise in SG&A costs was more than offset by the lower level of R&D
- **EPS** – The underlying loss per share was -0.46p (-0.63p reported) after allowing for the minority interest

Subsequent events

20th July 2016

COG announced its largest contract for CANTAB Connect Research with an international biobank, worth £0.5m. Biobanks collect data and biological samples which are then catalogues according to genetic, biological and environmental traits, for use by researchers in medical research. This biobank intends to use COG's touchscreen tests to generate data to assess mental health in a population over a five year period.

20th September 2016

COG announced that it had secured the first contract for its CANTAB Recruit product launched earlier in 2016. This contract is with a major biotechnology company that is investigating a putative drug for Alzheimer's disease in a late-stage clinical trial. CANTAB Recruit will be used support patient enrolment into this trial.

29th September 2016

COG announced that it had won two significant contracts with US biopharmaceutical companies using its cloud based platform CANTAB Connect technology. In total the contracts will generate $3.7m, of which $1.1m will be recognised in the current financial year.

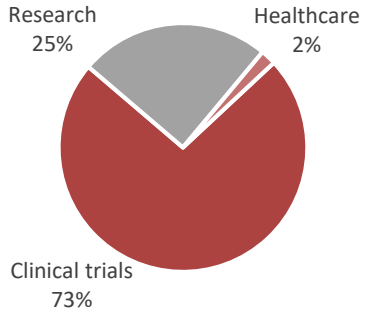
These three events all endorse our view that the company is well positioned for a strong second half to the current financial year and into subsequent years. Also, they support the investment that has been made into the company's accelerated growth strategy.

Financials & Investment case

Financial history

Cambridge Cognition was listed on AIM on 18th April 2013. At the time it raised £5.04m (gross) through the issue of 7.2m new shares at 70p per share. No further capital was raised until the company undertook a Placing on 28th April 2016, raising £1.25m (gross) through the issue of 3.39m new shares at 37p per share.

COG business areas



Sales 2016E: £6.8m

Source: Hardman & Co Life Sciences Research

Divisional analysis

Clinical trials

The largest division by sales is Clinical Trials, which is expected to account for about 72% of group sales in 2016, up from 67% in 2015. In 2016, this division will benefit from the delayed order from a pharmaceutical client which delayed the onset of a clinical trial at the end of last year. Underlying sales growth, excluding the contribution from this large order is nearer +20%. Because much of the clinical trial revenue is an access license to COG's software, it carries a high margin, which we expect to average out at about 17-18% in each of the next two years. Medium-term, the clinical trials business is forecast to become the main contributor to group profitability.

Divisional analysis

Year end Dec (£000)	2013	2014	2015	2016E	2017E	2018E
Sales						
Clinical trials	2,497	3,926	3,395	5,008	5,558	6,726
Research	1,493	1,675	1,544	1,698	2,072	2,507
Healthcare	158	201	103	136	408	816
Group sales	**4,148**	**5,802**	**5,042**	**6,842**	**8,039**	**10,049**
Trading result						
Clinical trials	216	458	197	866	1,001	1,298
Research	1,014	841	303	510	642	815
Healthcare	-945	-992	-1,102	-661	-503	-221
Central costs	-2,425	-862	-498	-548	-603	-651
Underlying EBIT	**-1,989**	**-212**	**-591**	**167**	**538**	**1,241**
Clinical trials						
Sales growth	-40.6%	+57.2%	-13.5%	+47.5%	+11.0%	+21.0%
Trading margin	8.7%	11.7%	5.8%	17.3%	18.0%	19.3%
Research						
Sales growth	+8.2%	+12.2%	-7.8%	+10.0%	+22.0%	+21.0%
Trading margin	67.9%	50.2%	19.6%	30.0%	31.0%	32.5%
Healthcare						
Sales growth	+61%	+27%	-49%	+32%	+200%	+100%
Trading margin	-	-	-	-486%	-123%	-27%
Clinical trials	8.7%	11.7%	5.8%	17.3%	18.0%	19.3%
Research	67.9%	50.2%	19.6%	30.0%	31.0%	32.5%
Healthcare	-	-	-	-	-123.2%	-27.1%
Trading margin	**6.9%**	**5.3%**	**-11.9%**	**10.4%**	**14.2%**	**18.8%**

Source: Hardman & Co Life Sciences Research

Cognitive research

The academic business has been the most consistent performer over the last few years. In 2016, sales are forecast to rise about +10%, slightly higher than seen recently for two reasons. First, the older product (CANTAB Eclipse), although still used, will gradually become superseded by the more enhanced cloud version, CANTAB Connect Research. Secondly, part of the rationale for opening the US offices was to place the marketing team closer to the end-user, with more sales going to US academic institutions and the small, start-up, biotechnology companies.

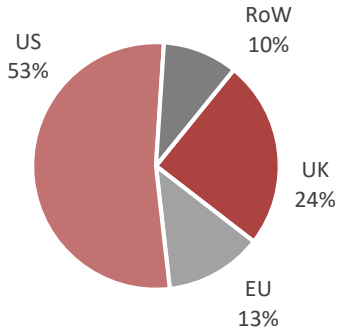
Because the majority of the sales are in the form of licensing income from software access, this division carries the highest margins, which we are forecasting will stabilise around the 30-35% level in coming years.

Healthcare technology

In the enhanced growth strategy, all the investment in the Healthcare technology division is expected to result in improved financial performance. Some of the newly released products (CANTAB Mobile) are more targeted towards this division, which focuses more on individual than group performance. Longer-term, we also expect the new wearables, Cog Kit, to make more of an impact. The new venture, CANTAB Corporate Health in conjunction with Shandwell is expected to begin making a meaningful contribution.

Despite these positives, although losses are forecast to reduce significantly, this division is unlikely to reach profitability until fiscal 2019. Having said that, it could also be quite volatile, as one new occupational health contract from a sizeable global organisation could dramatically alter this picture.

Geographical sales breakdown



Sales 2016E: £6.8m

Source: Hardman & Co Life Sciences Research

Profit & Loss

- **Sales** – Group sales are forest to rise to £6.8m in 2016 (+36%, with underlying growth nearer +18%) and to £8.0m in 2017 (+17%)
- **Gross margin** – The gross margin is high and expected to remain high (83-85%) since licence access fees represent software which has minimal costs. Over the next few years, gross margins are likely to ease back a little as some of the newer technologies (wearables) have a bought-in cost associated with them
- **Marketing spend** – Given recent product launches and investment in US infrastructure, SG&A is likely to rise, albeit at a lower rate than sales growth. Excluding R&D, which we view as a separate item, SG&A is forecast at -£4.6m in 2016, rising to -£5.3m in 2017 on continued investment
- **R&D spend** – Much of the development expenditure has already been made, therefore investment R&D is likely to fall. However, COG and its clients operate in a cloud-based global environment and continual investment in a safe, encrypted, product is paramount, so maintenance R&D is expected to be around £0.7-0.9m per annum
- **Grants/other income** – Expected to be zero in the future, from £509k in 2015
- **Underlying EBIT** – Taking all of these assumptions into account, underlying EBIT (excluding share based payments) is forecast at £166k in 2016, rising to £535k in 2017. Thereafter, as the Healthcare business moves into profit, EBIT growth is quite considerable and falls straight through to the bottom line

- **Tax** – In recent years COG has benefitted from a modest tax credit, which is unlikely to recur in future as R&D moves away from development spend. However, historic tax losses have been carried forward and we expect minimal tax liability in the medium term
- **Underlying EPS** – Forecasts indicate that COG will make basic EPS on 0.9p (0.5p reported) in 2016. Increased profitability is expected to see this rise to 2.6p in 2017 and around 6p in 2018
- **Currency** – Forecasts are based on constant currency. If the recent weakness in sterling was to persist until the end of the year, and given that over 50% of sales are priced in USD, any correction to numbers based on currency translation is likely to be in an upward direction

Profit & Loss account

Year end Dec (£000)	2013	2014	2015	2016E	2017E	2018E
Sales	**4,148**	**5,802**	**5,042**	**6,842**	**8,039**	**10,049**
COGS	-490	-866	-590	-1,074	-1,343	-1,578
Gross profit	**3,658**	**4,936**	**4,452**	**5,768**	**6,696**	**8,471**
Gross margin	88.2%	85.1%	88.3%	84.3%	83.3%	84.3%
Discovery & Dev.	-1,240	-1,242	-1,304	-1,000	-900	-855
SG&A	-4,558	-4,249	-4,248	-4,601	-5,261	-6,376
EBITDA	**-2,180**	**-593**	**-1,156**	**111**	**481**	**1,187**
Depreciation & Amortis.	-40	-38	-56	-55	-54	-53
Other income	151	343	509	0	0	0
Underlying EBIT	**-1,989**	**-212**	**-591**	**166**	**535**	**1,240**
Share based costs	-238	-92	-68	-76	-84	-92
Statutory Op. profit	-725	0	-208	0	0	0
Net financial income	-32	9	0	2	3	2
Pre-tax profit	**-2,021**	**-203**	**-591**	**168**	**538**	**1,242**
Exceptional items	0	0	0	0	0	0
Reported pre-tax	-2,984	-295	-867	92	454	1,150
Tax payable/credit	129	122	85	0	0	0
Tax rate	4%	41%	10%	0%	0%	0%
Minorities	0	0	0	0	0	0
Underlying net income	**-1,892**	**-81**	**-506**	**168**	**538**	**1,242**
Statutory net income	-2,855	-173	-782	92	454	1,150
Ordinary shares						
Period-end (m)	16.89	16.93	17.04	20.43	20.43	20.43
Weighted average (m)	13.42	16.44	16.83	19.33	20.43	20.43
Fully diluted (m)	14.54	18.29	18.71	21.21	22.30	22.30
Underlying Basic EPS (p)	**-14.10**	**-0.49**	**-3.01**	**0.87**	**2.63**	**6.08**
Statutory Basic EPS (p)	-21.27	-1.05	-4.65	0.48	2.22	5.63
U/l Fully-diluted EPS (p)	**-13.01**	**-0.44**	**-2.71**	**0.79**	**2.41**	**5.57**
Stat. Fully-dil. EPS (p)	-19.63	-0.95	-4.18	0.43	2.03	5.16
DPS (p)	0.00	0.00	0.00	0.00	0.00	0.00

Source: Company reports

Balance sheet

- **Net cash position** – At the end of 2015, the company had a net cash position of £756k. This was boosted by the Placing in April 2016, which raised £1,139k net of costs
- **Joint venture** – The new joint venture for occupational health will be included in the balance sheet as other investments

Balance sheet						
Year end Dec (£000)	**2013**	**2014**	**2015**	**2016E**	**2017E**	**2018E**
Shareholders' funds	2,130	2,049	1,413	2,704	3,158	4,308
Cumulated goodwill	352	352	352	352	352	352
Total equity	2,482	2,401	1,765	3,056	3,510	4,660
Share capital	169	169	170	204	204	204
Reserves	1,961	1,880	1,243	2,500	2,954	4,104
Provisions/liabilities	0	0	0	0	0	0
Deferred tax	0	0	0	0	0	0
Long-term loans	0	0	0	0	0	0
Bank overdrafts	0	0	0	0	0	0
less: Cash	2,261	1,519	756	1,866	2,041	2,826
Invested capital	**-131**	**530**	**657**	**838**	**1,117**	**1,482**
Fixed assets	53	64	141	136	135	137
Intangible assets	0	0	0	0	0	0
Inventories	123	185	58	48	48	60
Trade debtors	*512*	*1,058*	*1,008*	*1,368*	*1,607*	*2,009*
Other debtors	*464*	*574*	*633*	*683*	*743*	*803*
Tax liability/credit	*0*	*0*	*0*	*0*	*0*	*0*
Trade creditors	*-526*	*-543*	*-486*	*-885*	*-1,106*	*-1,300*
Other creditors	*-1,109*	*-1,160*	*-1,049*	*-864*	*-662*	*-579*
Debtors less creditors	-659	-71	106	302	582	933
Invested capital	**-131**	**530**	**657**	**838**	**1,117**	**1,482**
Net cash/(debt)	**2,261**	**1,519**	**756**	**1,866**	**2,041**	**2,826**
Stock days	10	10	9	3	2	2
Debtor days	75	49	75	63	68	66
Creditor days	38	38	39	44	55	55

Source: Company reports

Cashflow

The cashflow statement for COG is relatively straight-forward. Free cashflow is dominated by the input from the P&L account with modest adjustments as follows:

- Trading profit
- Less changes in working capital, usually modest
- Less capital expenditure, forecast to average about £100k per annum
- Plus any capital increases

In 2016, cash utilisation from operations will be offset by the capital increase in April. In subsequent years, as the group improves profitability, it becomes cash generative and, in the absence of any acquisitions, the group does not appear to have further need to tap the capital markets.

Cashflow						
Year end Dec (£000)	**2013**	**2014**	**2015**	**2016E**	**2017E**	**2018E**
Trading profit	-1,989	-212	-591	166	535	1,240
Depreciation	40	38	56	55	54	53
Amortisation	0	0	0	0	0	0
Inventories	-10	-62	127	10	-12	-15
Working capital	215	-595	-212	-300	-352	-441
Exceptionals/provisions	-725	0	-208	0	0	0
Disposals	0	0	0	0	0	0
Other	-6	0	0	0	0	0
Company op cashflow	**-2,475**	**-831**	**-828**	**-69**	**224**	**837**
Net interest	3	9	0	2	3	2
Tax paid/received	0	129	120	88	0	0
Operational cashflow	**-2,472**	**-693**	**-708**	**21**	**227**	**840**
Capital expenditure	-21	-49	-133	-50	-53	-55
Sale of fixed assets	0	0	0	0	0	0
Free cashflow	**-2,493**	**-742**	**-841**	**-29**	**175**	**785**
Dividends	0	0	0	0	0	0
Acquisitions	-300	0	0	0	0	0
Disposals	0	0	0	0	0	0
Other investments	0	0	0	0	0	0
Cashflow after invests.	**-2,793**	**-742**	**-841**	**-29**	**175**	**785**
Share repurchases	0	0	0	0	0	0
Share issues	4,413	0	78	1,139	0	0
Currency effect	0	0	0	0	0	0
Borrowings acquired	0	0	0	0	0	0
Change in net debt	**1,620**	**-742**	**-763**	**1,110**	**175**	**785**
Hardman FCF/share (p)	-18.4	-4.2	-4.2	0.1	1.1	4.1
Opening net cash	641	2,261	1,519	756	1,866	2,041
Closing net cash	**2,261**	**1,519**	**756**	**1,866**	**2,041**	**2,826**

Source: Company reports

Valuation

When valuing the likes of Cambridge Cognition, our usual approach is two-fold. First, to compare the valuation to that of suitable peers quoted on global markets. Secondly, to investigate the price paid for similar companies in the event of trade sales. The problem in this instance is that many of COG's competitors are either unquoted – Screen Inc, CNS Vital Signs, Bracket Global, Neurotrax, Brain Baseline – companies or academic organisations. Secondly, there is little evidence of suitable M&A in this space.

Comparative valuation

Cogstate

The main quoted company is Cogstate, the Australian-based market leader, which is quoted on the ASX. Cogstate is clearly a competitor based on track record. It does not have the same range of computer-based products, but is market leader on

account of its traditional strength in 'pencil & paper' tests of cognitive impairment. It is also a major competitor in clinical trials, with 94% of its annualised 2015 sales coming from this area and a strong forward order book.

Brain Resource

Brain Resource is also an Australian-based quoted competitor. However, its focus is much more on personalised medicine and occupational health, with products for adult depression, ADHD in children and addiction within employees. The company does have a very impressive list of well-known global clients.

Ixico

Being UK-based and quoted on AIM, Ixico has also been included in our comparator valuation table. The company has a greater focus on Alzheimer's disease and dementia, with products to help in the clinical decision making process. Much of the company's work is in clinical trials with several large pharmaceutical companies as clients.

Comparative valuation

Company	**Brain Resource**	**Cogstate**	**CamCog**	**Ixico**
Ticker	**BRC**	**CGS**	**COG**	**IXI**
Local currency	AUD	AUD	GBP	GBP
Share price (lc)	0.14	0.9	82.5	25.5
Shares in issue (m)	149.5	110.0	20.4	26.4
Mkt cap (lcm)	20.9	97.9	16.9	6.7
Mkt cap (£m)	12.8	59.8	16.9	6.7
Cash	4.6	7.5	1.3	3.2
Debt	-10.6	0.0	0.0	0.0
EV (lc)	26.9	90.4	15.5	3.6
EV (£m)	**16.5**	**55.2**	**15.5**	**3.6**
2015 sales (lcm)	4.1	25.1	5.0	1.5
2016E sales (lcm)	4.5	32.8	6.8	2.5
Sales growth	10%	30%	36%	62%
EV/sales	**6.0**	**2.8**	**2.3**	**1.4**
Relative rating	2.6	1.2	-	0.6

lc = local currency
Prices/currencies taken at close of business on 7th October 2016
Source: Company reports; Hardman & Co Life Sciences Research

Based against the annualised statistics for these three peers, Cambridge Cognition commands one of the lowest ratings, despite being the second largest in terms of sales and with the fastest annualised sales growth rate. The market has started to appreciate this and improved the rating of COG, which is currently trading on a prospective EV/sales of 2.3x. Although it is now much closer to the rating of Cogstate, the rating remains well below that of Brain Resource, which is hampered by a significant level of convertible debt.

COG announced good interim results recently with sales up +11%. However, the benefits of investment in marketing are expected to be realised more in the second half of 2016 and beyond. This suggests that, once clear evidence of its accelerated growth strategy is published, the stock will continue to be re-rated. As a guide, given its similar product maturity, market position and sales growth profile, if COG were to trade nearer that of Cogstate it would command a share price of 100-120p.

Company matters

Registration

Incorporated in England & Wales with company registration number: 8211361

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Board of Directors

Board of Directors				
Position	**Name**	**Nominations**	**Remuneration**	**Audit**
Chairman	Michael Lewis	M	C	M
Chief Executive Officer	Dr Steven Powell			
Chief Financial Officer	Nick Walters			
Non-executive director	Dr Nicholas Kerton	M	M	M
Non-executive director	Dr Andrew Blackwell	C	M	M
Non-executive director	Eric Dodd	M	M	C

M = member; C = chair
Source: Company reports

Michael Lewis – Non-executive Chairman

Mike is an experienced healthcare and pharmaceutical industry executive. Apart from Cambridge Cognition, he is also Chairman of iPlato, an m-Health provider, Haem02 and Glyconics Ltd, as well as a director of Mikale Ltd. He is also a lecturer, speaker and invited Chair of innovation sessions at NHS Expo, Chairs the KTN Medtech group, and was past Chair of the Assisted Living Innovation platform. He previously has held senior roles at Gambro (Brussels), Boston Scientific (Paris), C.R. Bard (New Jersey), Sybron (Switzerland) and Becton Dickinson (UK).

Dr Steven Powell – Chief Executive Officer

Graduated in microbiology from the University of Wales and awarded a PhD from the University of Aberdeen. Steven has over 30 years operational and investment experience in pharmaceutical and healthcare R&D and his operational experience includes appointments with Beecham Pharmaceuticals (GSK), Whatman, Chiroscience, Celsis, Active Biotech, KS Biomedix and Plethora Solutions. In 2003, he joined Gilde Healthcare, a pan-European life sciences investment fund and remains an adviser to the fund. To date, Steven has co-founded four companies of which two have undergone trade sales.

Nick Walters – Chief Financial Officer

A chartered accountant, Nick has served as Finance Director, Deputy Chairman and Chairman on a number of Boards. Nick has over thirty years' experience across a wide range of industry sectors and a track record for addressing the fundamentals in these companies and setting them up for sustainable growth. Nick has previously worked closely with Nick Kerton at both Sirigen Group and Maybridge.

Dr. Nicholas Kerton – Non-executive director

Nick is an experienced director of public and private companies in the healthcare industry. With a PhD in Organic Synthetic Chemistry from Nottingham University, he joined the Wellcome Foundation, followed by senior business development and sales roles DuPont and Whatman plc before moving into microbiology as Managing Director of Malthus Instruments, a subsidiary of Radiometer of Denmark. Nick was a member of the management team who established Celsis PLC, one of the first biotechnology companies to float on the LSE, led the successful sale of Maybridge to Fisher Scientific, and founded Lab21. Prior to joining Cambridge Cognition, he managed Sirigen Group from initial venture capital funding in 2008 through to selling the business to Becton Dickinson in August 2012. Nick moved to a non-executive role in 2015.

Dr Andrew Blackwell – Non-executive director

Following an MA and a PhD in psychology from the University of St Andrews, Dr Blackwell undertook post-doctoral training in cognitive neuropsychology and psychopharmacology at the University of Cambridge, working closely with the main inventors of CANTAB, Professors Trevor Robbins and Barbara Sahakian. He joined Cambridge Cognition in 2006 and was appointed as a director and Chief Scientific Officer in 2007. Dr Blackwell became a Non-Executive Director in July 2015.

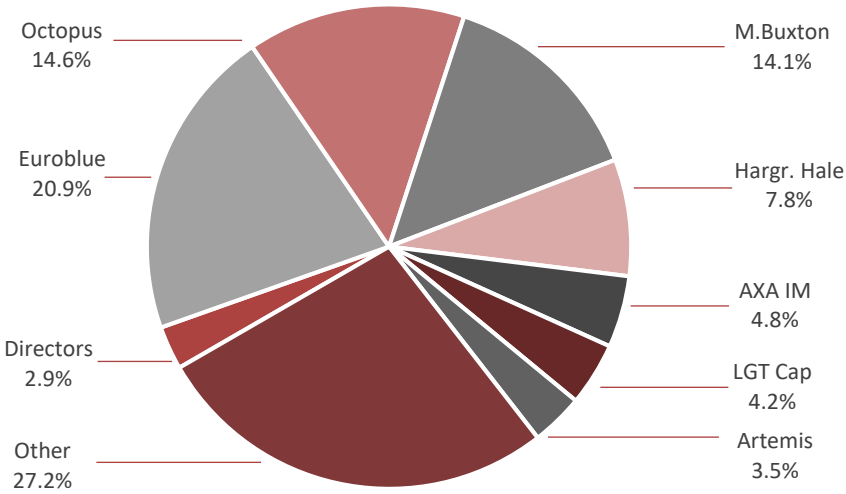
Eric Dodd – Non-executive director

Eric qualified as a Chartered Accountant with Deloitte, has an MBA from London Business School and a BEng from Loughborough University. Having been Chief Financial Officer of KBC Advanced Technologies, Antisoma, Morse and Stanmore Implants Worldwide Holdings, he brings significant board-level experience to the Company.

Shareholders

Ordinary shares of £0.01 in issue: 20,429,235 (at 1st September 2016)

Key shareholders



Source: Company reports

Glossary

CANTAB	Cambridge Neuro-psychological Test Automated Battery
FDA	US Food and Drug Administration
DANA	Defense Automated Neurobehavioural Assessment
GPCOG	General Practitioner assessment of Cognition – a screening tool for cognitive impairment designed for general practitioners, primary care physicians, and family doctors
MCI	Mild Cognitive Impairment
MMSE	Mini–Mental State Examination – a 30-point questionnaire used extensively in clinical and research settings to measure cognitive impairment and screen for dementia
NDA	New drug application
ONS	Office of National Statistics
PTSD	Post-traumatic Stress Disorder
6CIT	Six-item Cognitive Impairment Test – brief cognitive function test which takes less than five minutes and is widely used in primary care settings

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www.bracketglobal.com

www.brainbaseline.com

www.cnsvs.com

www.cogstate.com

www.manusneuro.com

www.neurotrax.com

www.pdf.org

www. screen-inc.com

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