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iCAD Inc (ICAD-NASDAQ)

ICAD: Study Shows IORT Superior To EBRT in Quality of Life, Cost

Based on average EV/S and P/S multiples of five comparable companies, iCAD is valued at approximately $7.50/share.

Current Price (12/15/17)	$3.65
Valuation	**$7.50**

OUTLOOK

A study which was recently published in Cost Effectiveness and Resource Allocation (a peer-reviewed online publication "aimed at health economists, health services researchers, and policy-makers with an interest in enhancing the flow and transfer of knowledge relating to efficiency in the health sector") demonstrated that IORT is associated with a longer quality of life, lower overall cost and higher monetary benefit as compared with external beam radiation therapy among patients with early-stage breast cancer.

While ICAD's IORT breast cancer therapy segment growth (particularly as it relates to the U.S.) has been less substantial than other areas, as we have noted in our coverage of the company, we have and continue to believe that key to fueling greater adoption and utilization of IORT lies with additional clinical data favoring its use over that of traditional radiation therapy (i.e. EBRT). This study, along with ICAD's ongoing 1,000-patient ExBRT (Safety and Efficacy Study of Intra-Operative Radiation Therapy (IORT) Using the Xoft Axxent eBx System at the Time of Breast Conservation Surgeryfor Early-Stage Breast Cancer) study, should help in that regard.

SUMMARY DATA

52-Week High	**$6.07**
52-Week Low	**$3.13**
One-Year Return (%)	**19.36**
Beta	**1.48**
Average Daily Volume (sh)	**42,114**
Shares Outstanding (mil)	**17**
Market Capitalization ($mil)	**$60**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**22**
Insider Ownership (%)	**19**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**-3.2**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2017 Estimate	**N/A**
P/E using 2018 Estimate	**N/A**
Zacks Rank	**N/A**

Risk Level	**Above Avg.,**
Type of Stock	**Small-Blend**
Industry	**Comp-Software**

ZACKS ESTIMATES

Revenue
(in '000 of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2016	6038 A	7369 A	6003 A	6928 A	26338 A
2017	6791 A	6409 A	7000 A	7390 E	27590 E
2018					38439 E
2019					48693 E

Earnings per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2016	-$0.16 A	-$0.10 A	-$0.17 A	-$0.20 A	-$0.63 A
2017	-$0.18 A	-$0.16 A	-$0.14 A	-$0.14 E	-$0.62 E
2018					-$0.35 E
2019					$0.05 E

Zacks Projected EPS Growth Rate - Next 5 Years % **N/A**

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Decision-Tree Analysis of Published Studies Indicates IORT Superior To EBRT in QoL, Cost:

A study which was recently published in *Cost Effectiveness and Resource Allocation* (a peer-reviewed online publication "aimed at health economists, health services researchers, and policy-makers with an interest in enhancing the flow and transfer of knowledge relating to efficiency in the health sector") demonstrated that IORT is associated with a longer quality of life, lower overall cost and higher monetary benefit as compared with external beam radiation therapy among patients with early-stage breast cancer.

The study, *Lifetime cost-effectiveness analysis of intraoperative radiation therapy versus external beam radiation therapy for early stage breast cancer*[1], incorporated data from previously published peer-reviewed studies of IORT and EBRT into a Markov decision tree. Key inputs into the model (for both IORT and EBRT tree branches) included life expectancy, amount of radiation exposure and related complications, probability of acute and long-term complications, probability of recurrent cancer, probability of death due to cancer, probability of death due to other causes, cost of each treatment (including cost of treating potential complications and cancer recurrence) as well as several quality of life measures including those related to complications (associated with each therapy, radiation exposure or other factors) and cancer recurrence.

Results showed that IORT was not only less costly than (up to 6-weeks of) EBRT, but that it was also associated with a greater number of 'quality adjusted life years' or QALYs (i.e. a commonly used measure of both quality and length of life). This also meant that the 'net monetary benefit' favored IORT as compared to EBRT.

In terms of cost, which included cost of not only the individual breast cancer treatments, but also that related potential complications, estimated lifetime cost of IORT was $53,179, while EBRT lifetime cost was $63,828. The higher cost of EBRT largely relates to greater risk of radiation-exposure complications (such as major coronary events and development of other solid cancers) and the related cost to treat these.

In terms of QALY, the analysis showed that IORT was associated with QALY of 17.86, while EBRT was 17.06. Greater risk of radiation-related complications associated with EBRT were, again, the major factors that favored IORT.

Finally, cost and QALY were used to calculate what the authors called '**net monetary benefit**' (NMB), which was used to determine which treatment modality was the most cost effective over a lifetime. NMB is calculated as: (amount a person is willing to pay per QALY x QALYs) – lifetime costs. The authors assumed a person is willing to pay $50k per QALY, which is based on its use in prior clinical studies spanning more than decade. NMB for the two treatment modalities was:

IORT: ($50,000 x 17.86) - $53,179 = $839,821
EBRT: ($50,000 x 17.06) - $63,828 = $789,172

In other words, assuming that a patient with early-stage breast cancer values each QALY at $50k and will choose between either EBRT or IORT, this study indicates that they would benefit (on average) by $50,649 (i.e. $839,921 - $789,172) over their lifetime by choosing IORT.

While previous studies have shown that IORT is more cost-effective than EBRT, **this is the only study that evaluates QALY, cost and net monetary benefit of the two modalities over the lifetime of patients**. Authors of this study note that the difference is important given that the higher radiation doses of EBRT are associated with long-term complications, particularly major cardiac events due to a larger area of the chest being exposed to radiation (and at higher doses versus IORT). As noted, these cardiac-related complications are largely the reason why IORT results in a lifetime NMB which is superior to that of EBRT.

The authors also note that the cost-advantage of IORT is also a benefit to the overall healthcare system. Another advantage of IORT versus EBRT is that the former is performed in one session while the latter requires the patient to return for several radiation treatments – which means less disruptions to patients' lives, lower transportation burdens and, potentially, faster recovery of those patients which choose IORT. In fact, ICAD's management has pointed to these advantages as potentially helping to facilitate uptake in not only the U.S. but certain overseas markets as well. For example, IORT therapy's lower treatment burden could be attractive to patients living in rural

[1] Patel et al. Cost Eff Resour Alloc (2017) 15:22 DOI 10.1186/s12962-017-0084-5

areas of China (where ICAD's Axxent system and balloon applicators recently received regulatory clearance) which have to travel long distances to access radiation therapy.

Our comments:
While ICAD's IORT breast cancer therapy segment growth (particularly as it relates to the U.S.) has been less substantial than other areas, as we have noted in our coverage of the company, we have and continue to believe that key to fueling greater adoption and utilization of IORT lies with additional clinical data favoring its use over that of traditional radiation therapy (i.e. EBRT). This study, along with ICAD's ongoing 1,000-patient ExBRT (Safety and Efficacy Study of Intra-Operative Radiation Therapy (IORT) Using the Xoft Axxent eBx System at the Time of Breast Conservation Surgery for Early-Stage Breast Cancer) study, should help in that regard.

FINANCIAL MODEL

iCAD Inc.

	2016 A	Q1A	Q2A	Q3A	Q4E	2017 E	2018 E	2019 E
Cancer Detection	$17,133.0	$4,489.0	$4,231.0	$4,346.0	$4,664.5	$17,730.5	$27,051.1	$34,688.0
YOY Growth	-11.0%	14.2%	-13.6%	5.1%	11.8%	3.5%	52.6%	28.2%
% of total revenue	65.1%	66.1%	66.0%	62.1%	63.1%	64.3%	70.4%	71.2%
Therapy	$9,205.0	$2,302.0	$2,178.0	$2,654.0	$2,725.0	$9,859.0	$11,388.0	$14,005.0
YOY Growth	-58.7%	9.2%	-11.9%	42.0%	-1.1%	7.1%	15.5%	23.0%
% of total revenue	34.9%	33.9%	34.0%	37.9%	36.9%	35.7%	29.6%	28.8%
Total Revenues	$26,338.0	$6,791.0	$6,409.0	$7,000.0	$7,389.5	$27,589.5	$38,439.1	$48,693.0
YOY Growth	-36.6%	12.5%	-13.0%	16.6%	6.7%	4.8%	39.3%	26.7%
Cost of Revenues	$7,820.0	$2,102.0	$1,906.0	$2,357.0	$2,231.0	$8,596.0	$10,765.5	$13,323.8
Gross Income	$18,518.0	$4,689.0	$4,503.0	$4,643.0	$5,158.5	$18,993.5	$27,673.6	$35,369.2
Gross Margin	70.3%	69.0%	70.3%	66.3%	69.8%	68.8%	72.0%	72.6%
R&D	$9,518.0	$2,574.0	$2,232.0	$2,254.0	$2,344.0	$9,404.0	$9,784.0	$10,101.0
% R&D	36.1%	37.9%	34.8%	32.2%	31.7%	34.1%	25.5%	20.7%
Selling & Mktg	$10,179.0	$2,902.0	$2,690.0	$2,580.0	$2,771.1	$10,943.1	$12,838.7	$14,072.3
% Sell&Mktg	38.6%	42.7%	42.0%	36.9%	37.5%	39.7%	33.4%	28.9%
G&A	$8,791.0	$2,156.0	$2,205.0	$2,051.0	$2,351.0	$8,763.0	$10,864.0	$11,744.0
% G&A	33.4%	31.7%	34.4%	29.3%	31.8%	31.8%	28.3%	24.1%
Goodwill Impairment	$0.0	$0.0	$0.0	$4,700.0	$0.0	$4,700.0	$0.0	$0.0
Operating Income	($9,970.0)	($2,943.0)	($2,624.0)	($6,942.0)	($2,307.6)	($14,816.6)	($5,813.1)	($548.1)
Operating Margin	-37.9%	-43.3%	-40.9%	-99.2%	-31.2%	-53.7%	-15.1%	-1.1%
Other income	$9.0	$2,508.0	$0.0	$3.0	$0.0	$2,511.0	$0.0	$0.0
Other income, net	($53.0)	$2,503.0	($10.0)	($33.0)	($75.5)	$2,384.5	($315.5)	($367.0)
Pre-Tax Income	($10,023.0)	($440.0)	($2,634.0)	($6,975.0)	($2,383.1)	($12,432.1)	($6,128.6)	($915.1)
Taxes	$76.0	$17.0	($3.0)	($42.0)	($19.1)	($47.1)	$0.0	$0.0
Tax Rate	-0.8%	-3.9%	0.1%	0.6%	0.8%	0.4%	0.0%	0.0%
Net Income	($10,099.0)	($457.0)	($2,631.0)	($6,933.0)	($2,364.0)	($12,385.0)	($6,128.6)	($915.1)
YOY Growth	69.0%	82.0%	-67.0%	-159.2%	28.7%	-22.6%	50.5%	85.1%
Net Margin	-38.3%	-6.7%	-41.1%	-99.0%	-32.0%	-44.9%	-15.9%	-1.9%
EPS	($0.63)	($0.03)	($0.16)	($0.42)	($0.14)	($0.75)	($0.35)	($0.05)
YOY Growth	69.5%	82.3%	-62.9%	-151.8%	31.2%	-19.3%	53.6%	85.3%
Pro-forma adjustments	$0.0	($2,508.0)	$0.0	$4,700.0	$0.0	$4,700.0	$0.0	$0.0
Pro-forma EPS	($0.63)	($0.18)	($0.16)	($0.14)	($0.14)	($0.62)	($0.35)	($0.05)
Diluted Shares O/S	15,975	16,135	16,310	16,424	16,800	16,417	17,500	17,800

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HISTORICAL STOCK CHART



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