Project Report:

Nystagmus-Based Repositioning Device Marketing Plan

Course: ETM 555/655 High-Technology Marketing

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Executive Summary

Dr. John Epley, a pioneer in “canalith repositioning,” developed a cutting-edge Nystagmus-Based Repositioning (NBR) device for the treatment of benign paroxysmal positional vertigo (BPPV), which has been much anticipated by the medical industry. This high technology device will revolutionize the treatment of patients diagnosed with vertigo by offering a more effective and efficient option.

In this marketing plan, we have created a model for this unique device that addresses the needs of medical professionals, administrators, insurance companies, and patients. On the basis of literature research, surveys, and interviews, we present a framework that identifies the market segments and important factors that determine the compelling reasons that affect the purchase decision for the NBR device. As a result of our exhaustive research, we have proposed in the marketing plan how we will achieve our ultimate goal of successfully marketing the NBR device.

Three aspects differentiate the NBR from competitors: price, size, and technology. Our price is 80% lower than its predecessor, Epley Omniax; its footprint is an examination table compared to a 10-ft by 10-ft footprint for its predecessor; and the technology allows for the treatment to be performed more effectively while being recorded. These reasons are what will draw patients, practitioners, hospital/clinic administrators, and insurance providers to the NBR device as a treatment option for vertigo.

1. Market Analysis

Currently, there are difficulties in accurately diagnosing and reporting vestibular disorders. Statistics range widely in estimating how common they are, how often they occur, and what social impacts they have. However, the lowest estimates reflect the fact that vestibular disorders occur frequently and can affect people of any age.

One study estimates that as many as 35% of adults aged 40 years or older, approximately 69 million Americans, have experienced some form of vestibular dysfunction [1]. Other estimates show that 7.5 million patients with dizziness and possibly vertigo are examined each year in ambulatory centers [2]. In another study, the author found that the lifetime prevalence of vertigo in adults ages 18 to 79 is 7.4% with a clear increase in prevalence with age [3]. One report indicated that dizziness and vertigo together accounted for 2.5% of all emergency department visits during a 10-year period [4].

2. Customer Analysis

Figure 2.1 defines the customer base for the NBR device, and the customer value drivers for each. Hospital and clinic administrators value cost (purchase price, human resources, product integration, etc.); insurance companies also value cost (payments for treatment); private practitioners value affordability and device integrity; and patients value an improved quality of life.

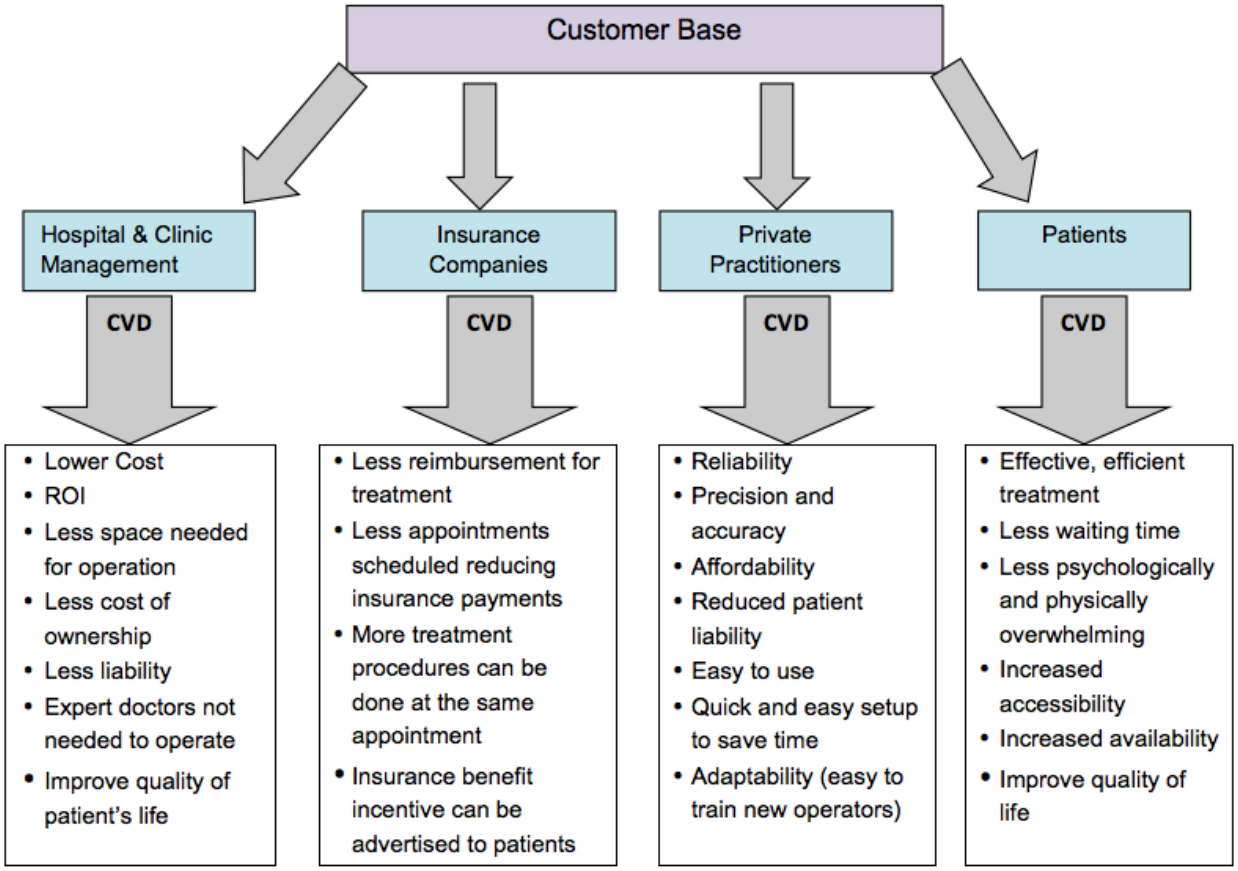

Figure 2.1: Customer Base

2.1 Hospital and Private Clinic Base

Currently, there are 5,724 registered hospitals in the United States [13].

2.2 Insurance Company Base

This section highlights the reimbursement offered by insurance companies and Medicare for the treatment of vertigo.

Table 2.1 - Diagnostic Testing Procedures [14]

Spontaneous nystagmus test	$84
Positional nystagmus test	$80
Caloric vestibular test	$160
Optokineticnystagmus test	$60
Oscillating tracking test	$56
Sinusoidal vertical axis rotational testing	$192
Vertical electrodes	$48
Computerized Dynamic Posturography	$250
Comprehensive hearing evaluation	$65

Tympanometry (impedance testing)	$34
Vestibular evoked myogenic potential	$252
Dynamic Visual Acuity Test (DVA)	$30/15 min
Gaze Stability Test (GST)	$30/15 min
Limits of Stability Test (LOS)	$30/15 min
Rhythmic Weight Shifting Test (RWS)	$30/15 min

2.3 Patient Base

Please see *Section 1: Market Analysis* for patient base analysis.

2.4 Private Practitioner Base[1]

According to one socioeconomic market research study in 2006, approximately 3,600 physicians were currently practicing, out of which approximately:

- 575 are operating five or more sites, 500 are operating four sites, 575 are operating three sites, 885 are operating two sites, and 1,508 are operating one site, making it a pool of approximate 10,000 facilities [5].
- Approximately 2,400 work in otolaryngology, of which 800 to 1,000 limit their practice to ear/nose/throat (ENT) and about 1,500 treat vertigo patients [5].

Approximately 12,000 neurotologists are registered in the U.S., out of which 2,257 focus on movement disorder, 1,850 in neuromuscular disorder, and 447 in neuron rehabilitation [9]. According to a 2009 report, 240,935 physical therapists are licensed in the United States. There were 81,691 licensed physical therapist assistants [6]. In 2008, there were 12,800 licensed audiologists, which is projected to grow up to 16,000 by 2018 [7][8]. Forty percent of ENT doctors have a vestibular lab with a 36% growth rate over five years [5].

In 2006, head injuries represented 21% of injuries recorded in the Navy/Marine Corps Combat Trauma Registry (CTR) at Naval Health Research Center (NHRC), San Diego, California. Presently, 60% of war-injured patients have traumatic brain injury (TBI), and mild TBI may be present in over 30% of war veterans with no recorded definite injury in theater [10]. World TBI is the second most common neurological disorder with a yearly incidence of more than 100,000 individuals. As a result, TBI costs the United States economy over $40 Billion annually [10].

[1] Definitions of the medical fields of the practitioners identified in the total available market are available in Appendix A.

Practitioners charge $150 to $200 per patient without insurance and see about 10 patients per day [12].

Figure 2.2 shows the total available market (TAM), share of market (SOM), and served available market (SAM) for the NBR device. Calculations are attached in Appendix B.

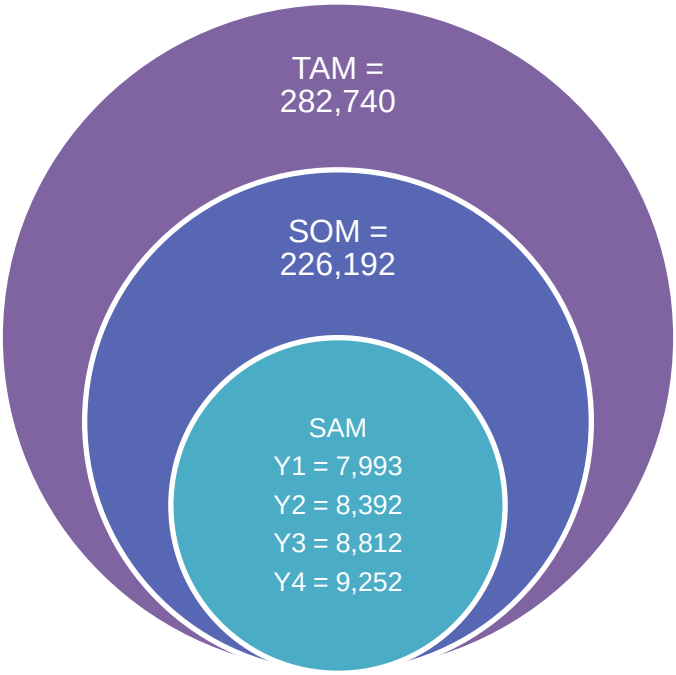

Figure 2.2: TAM, SOM, and SAM

2.5 Qualitative Analysis of Survey Results

Survey questions were generated and vetted through phone interviews with a neurotologist, audiologist, and physical therapist. They survey was conducted to figure out how many of the surveyed practitioners perform Epley maneuvers and for how long they have been performing them. There were also questions about how many times they have to treat a patient and how they treat the patients. The survey also asked respondents to rate various attributes based on their importance to the decision-making process to purchase the device. The questionnaire was also being used to gauge a price range for the device.

The first question asks about the current occupation the respondent is in. As identified in Section 2.4: Private Practitioner Base, the customers we want to survey are the practitioners who will be using this device: neurotologists, otolaryngologists, audiologists, physical therapists, and chiropractors, which is why there were no options to answer “other.” This survey was designed for that targeted audience. Figure 2.3

summarizes the occupations represented in the survey results. As you can see, otolaryngologist representation is lacking. If there was more time to conduct the survey, the team would have been able to reach out to at least one otolaryngologists to take the survey.

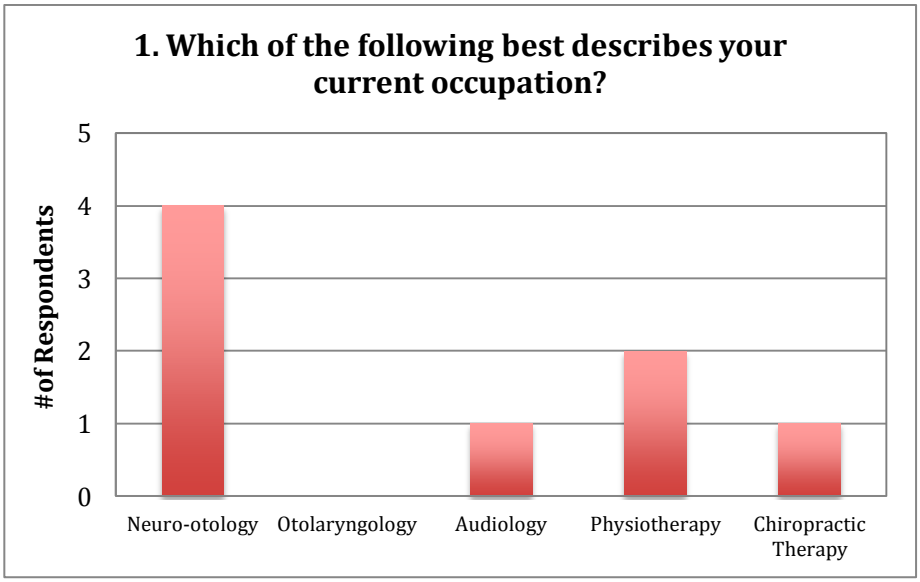

Figure 2.3: Survey results for occupations

The second question asks about how long each of the respondents has been performing Epley maneuvers to treat patients diagnosed with BPPV. The majority of the respondents have been performing maneuvers for more than five years (Figure 2.4). From Figures 2.5 and 2.6, you can see that the majority have been performing maneuvers manually, and it takes three visits or less to treat a single patient.

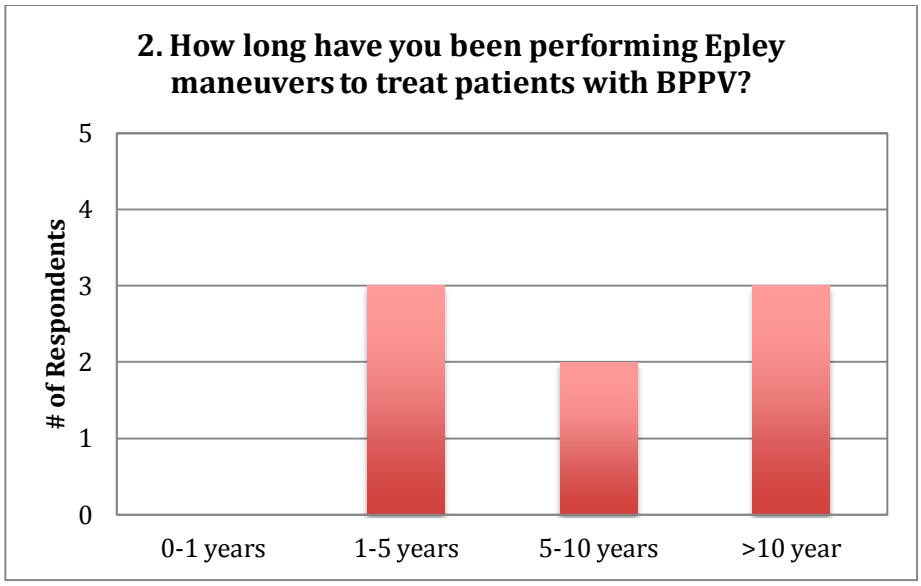

Figure 2.4: Survey results for length of time respondents performed Epley maneuvers

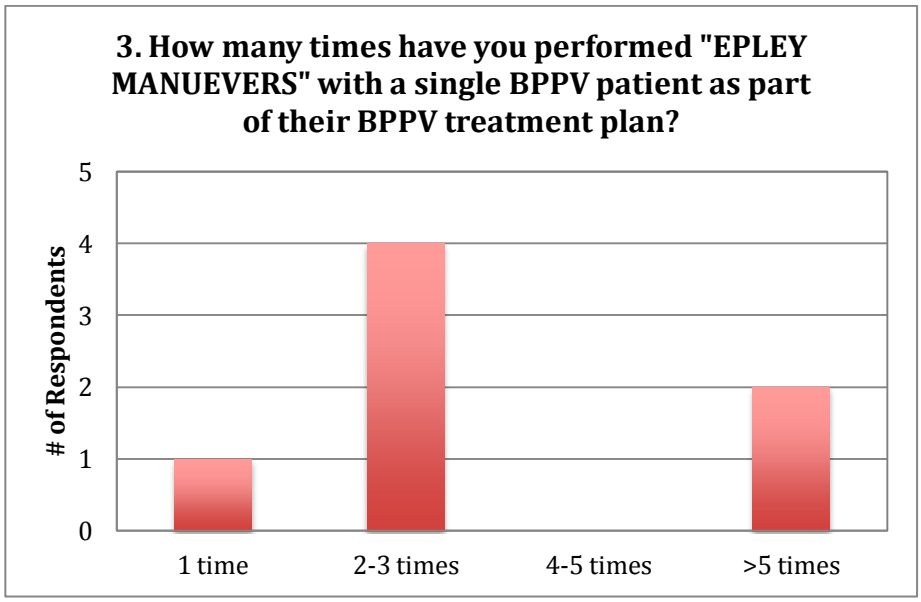

Figure 2.5: Survey results for number of times to treat a patient

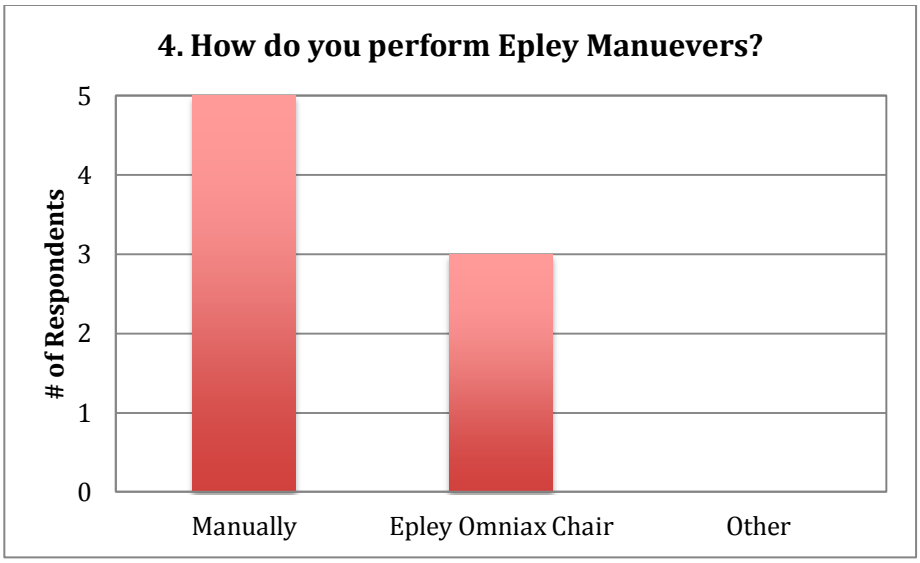

Figure 2.6: Survey results for how maneuvers are performed

Figure 2.7 depicts the aggregate rating for each of the attributes we identified as having an impact on the decision-making process for a practitioner to consider purchasing the NBR device. Reliability and integrity and affordability are the highest ranking attributes, followed by increased precision, efficiency, ease of use, programmability, availability of training, and reduced patient liability. Brand name is the least ranked attribute, which did not come as a surprise because there are not a lot of companies competing in this market, and of the companies that are in this market, practitioners are aware of who those entities are.

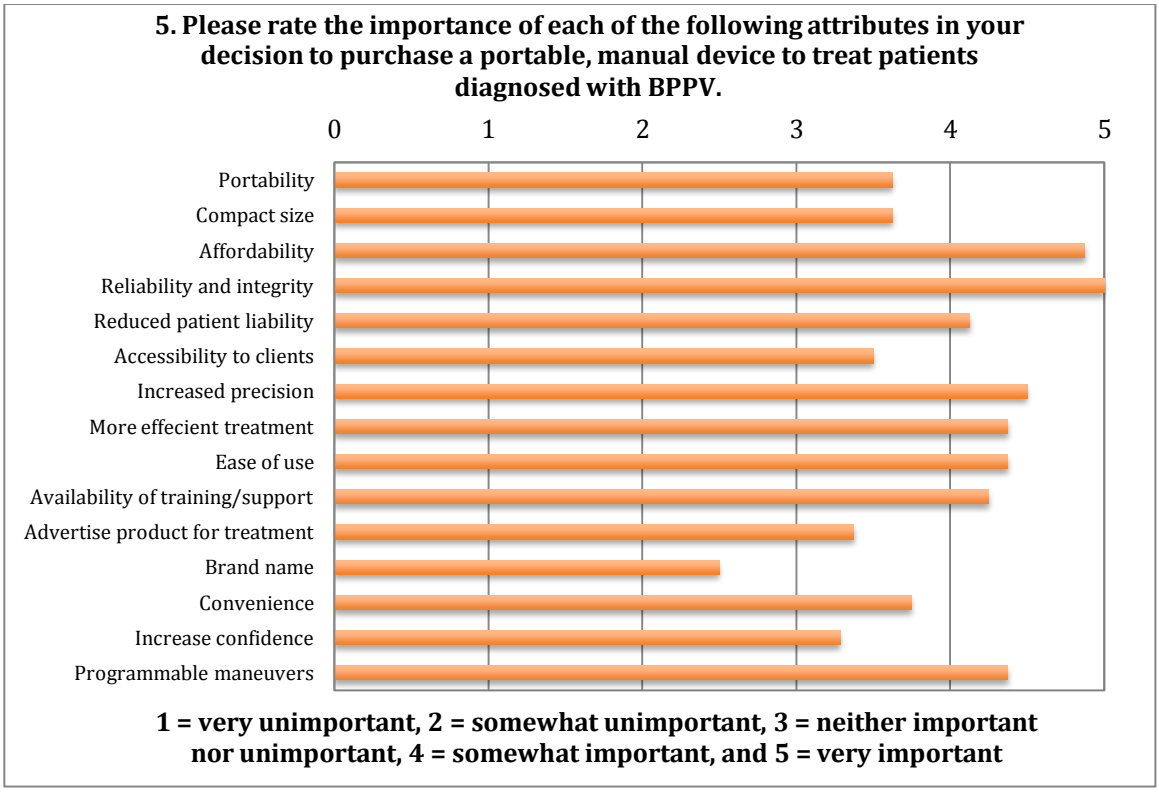

Figure 2.7: Survey results for aggregate attribute ranking

The sixth survey question asked how the NBR would add value to their practice; the responses are listed below.

- "My assistants can also use device without my guidance."
- "Wow factor to patient."
- "I can now safely perform the maneuver without being worried that I may inadvertently harm my patient."

Each of these responses enforces some of the attributes listed in survey question five: ease of use, advertising the device as part of a treatment plan ("advertise product for treatment"), and increased confidence.

The final question asks about the price each respondent would pay for the product package, which includes the NBR device, the required hardware and software, and training and support. The four responses ranged from $8,500 to $23,000, which falls within the price range for the device, but does not provide enough conclusive information to base the pricing strategy on.

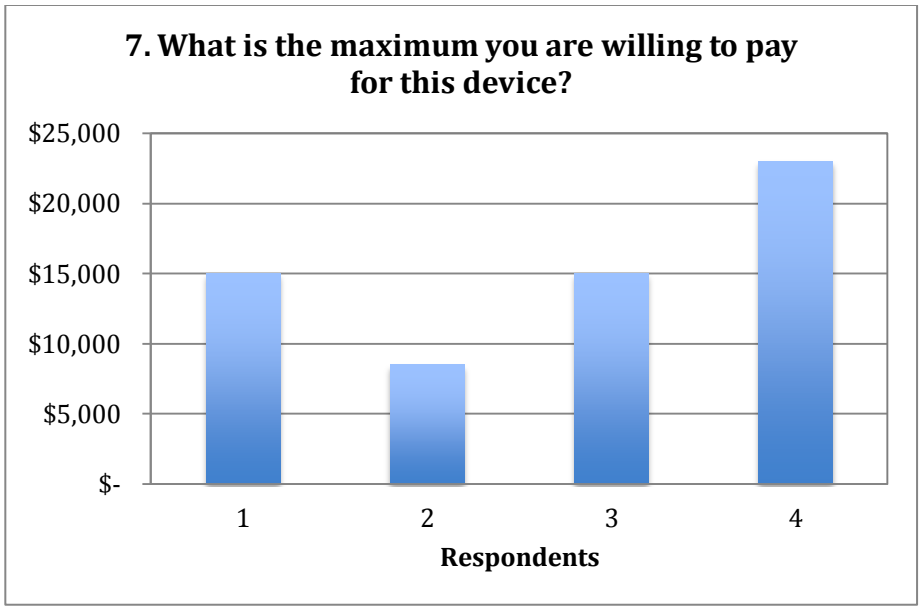

Figure 2.8: Survey results for price

The results from this survey conclude that the majority of practitioners perform Epley maneuvers manually, and that they value price and product integrity as the most influencing factors in purchasing the NBR device.

3. Competition Analysis

For the market competition of the NBR device, we analyze the five additional products, therapies, and a self-treating kit. All of the selected products, therapies, and self-treating kit in this analysis are represented in order to reflect the preferences of launching the NBR device to market.

Table 3.1: Competitive Analysis – Features

Features	NBR*	Epley Omniax	VF405	TRV Chair	GyroStim	Neuro Kinetic
Purchase Price	$24,000	$120,000	$22,000	$40,000-$50,000	$40,000-$50,000	$150,000
Goggle	Yes	Yes	Yes	Yes	Yes	Yes
Video Storage	Yes	Yes	Yes	Yes	Yes	Yes
Video Playback	Yes	Yes	Yes	Yes	Yes	Yes
Report Editor	Yes	Yes	Yes	Yes	Yes	Yes
Sound Recording	Yes	Yes	Yes	Yes	Yes	Yes
Eye Motion Tracking	Yes	Yes	Yes	Yes	Yes	Yes
Head Tracking Ability	Yes	Yes	No	Yes	Yes	Yes

Features	NBR*	Epley Omniax	VF405	TRV Chair	GyroStim	Neuro Kinetic
Switch One Camera/ Two Cameras	Yes	Yes	Yes	Yes	Yes	Yes
SW Controlled Light	Yes	No	Yes	Yes	Yes	No
Elapsed Test Time	Yes	Yes	Yes	Yes	Yes	Yes
Switch Operated Video Capture	Yes	Yes	Yes	Yes	Yes	Yes
Switch Operated Light Adjustment	Yes	Yes	Yes	Yes	Yes	Yes
Affordability	5	2	4	3	3	1
Ease of Operation	4	5	4	2	5	5
ROI	5	3	4	4	4	3
Precision and Accuracy of Maneuvers	4	5	1	3	4	5
Portability and Area of Operation	5	1	5	2	1	2
Maneuver Capability	3	5	3	3	4	3

*The rating is based on personal experience with the device, user feedback, and limited available knowledge of the products. Ranking is on a scale of 1 to 5, with 1 being low and 5 being high.

Table 3.2: Competitive Analysis – System Requirements

Requirement	NBR*	Epley Omniax	VF405	TRV chair	GyroStim	Neuro Kinetic
Rotary chair needed	No	Yes	No	Yes	Yes	Yes
Additional space for installation	No	Yes	No	Yes	Yes	Yes
Hardware and software	Yes	Yes	Yes	Yes	Yes	Yes

3.1 DizzyFIX

Figure 3.1 depicts DizzyFIX, which is a self-treating device consisting of a tube filled with fluid found in the inner ear. This device was designed to assist in performing Epley maneuvers. It costs $140 and comes with an instructional manual, mounting hat, and training DVD [15].

Figure 3.1: DizzyFIX

3.2 VF405 Video Frenzel

VF405 provides conditions for fixation-free observation of eye movements during spontaneous testing, positional and Dix-Hallpike testing, head impulse testing, and user defined testing [16].

Figure 3.2: VF405

3.3 Epley Omniax

The Epley Omniax system consists of an automated multi-axial (360°) patient positioning device, infrared video goggles, and a proprietary software with 3-D real-time monitoring and measurement of nystagmus and spatial orientation of the patient and of the semi-circular canals. It is the first generation of NBR, portrayed in Figure 3.3 [17].

Figure 3.3: Epley Omniax

3.4 TRV Chair

The TRV chair is manufactured in France, seen in Figure 3.4. The device enables mechanical assistance for management of BPPV. It is an armchair which is able to readily swivel between two axes in all planes of the semi-circular canals, for up to 360° or more. The patient is secured to the chair with a four-point harness and a headrest. Some predetermined positions permit accurate placement of the patient's head for diagnosis and treatment of BPPV of each canal. Removable abutments allow rapid stops to add deceleration for increased effect on the canals [18].

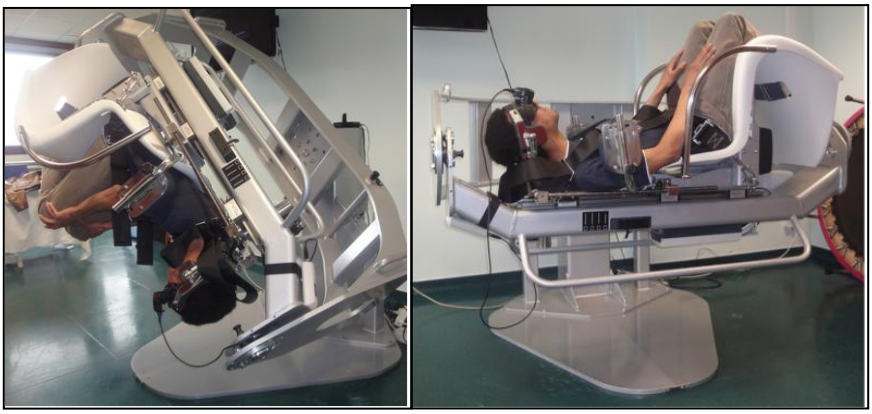

Figure 3.4: TRV Chair

3.5 GyroStim

GyroStim is a fully automated, computer-controlled multi-axis rotating chair. It is designed to assist clinicians and researchers by providing a means to deliver precise,

powerful, and controlled motion profiles to individuals ranging from small children to senior citizens, to elite athletes, to those with significant disabilities [19].

Figure 3.5: GyroStim

3.6 Neuro Kinetic Rotary Chair

The Neuro Kinetic Rotary Chair provides clinicians with a complete vestibular/neurotologic testing system solution that allows confidence in diagnosis; allows the ability to test a broader range of patients; and is in an isolated enclosure with patient monitoring, communication, and a digital eye tracking system [20].

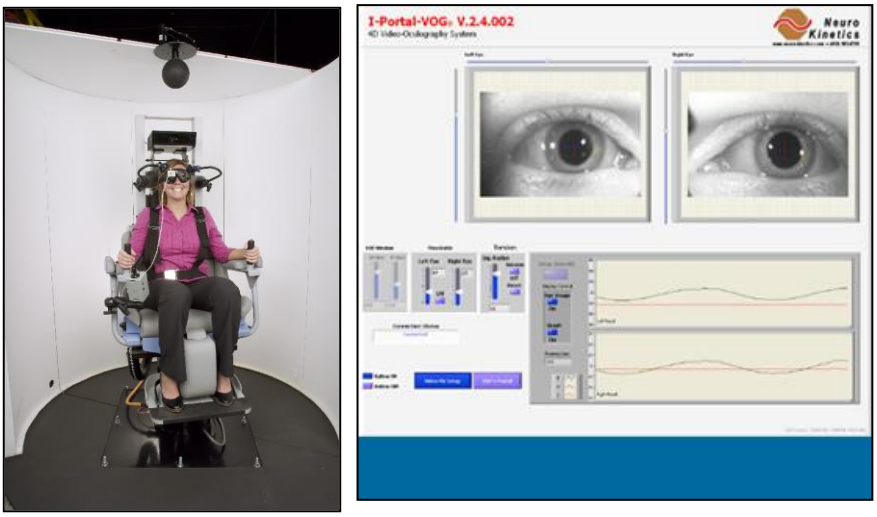

Figure 3.6: Neuro kinetic rotary chair

3.7 Therapies for BPPV

The following maneuvers and exercises are the option for patients who are uncomfortable with machines to be treated. The listed maneuvers and exercises are

free treatments that can be performed at home. These will affect Vesticon's sales growth adversely.

A study shows the affects of a modification of the popular Epley maneuver, the sham maneuver. At follow-up visits 10 days later, 50% of the canalith repositioning procedure (CRP) treated patients reported a resolution of vertigo compared with 19% of the sham-treated patients (*P*=0.02), and 67% of the CRP-treated patients had a negative Dix-Hallpike maneuver compared with 38% of the sham-treated patients (*P*=0.05).

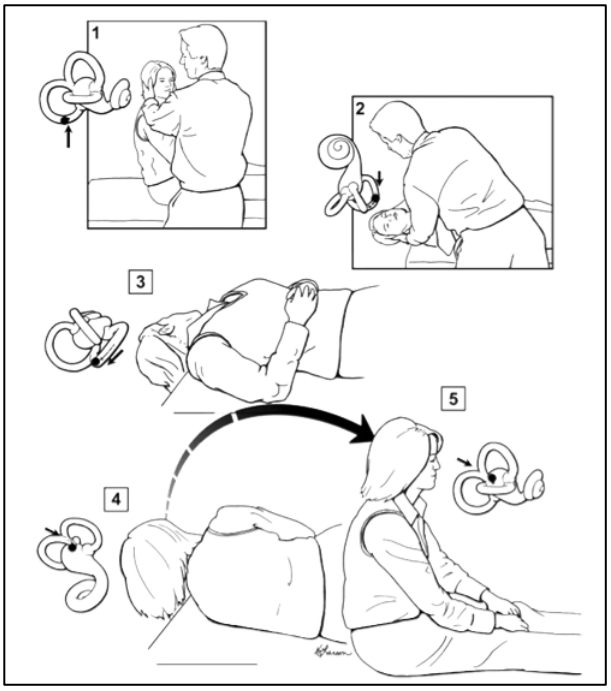

Figure 3.7: Dix-Hallpike maneuver or canalith repositioning procedure [21]

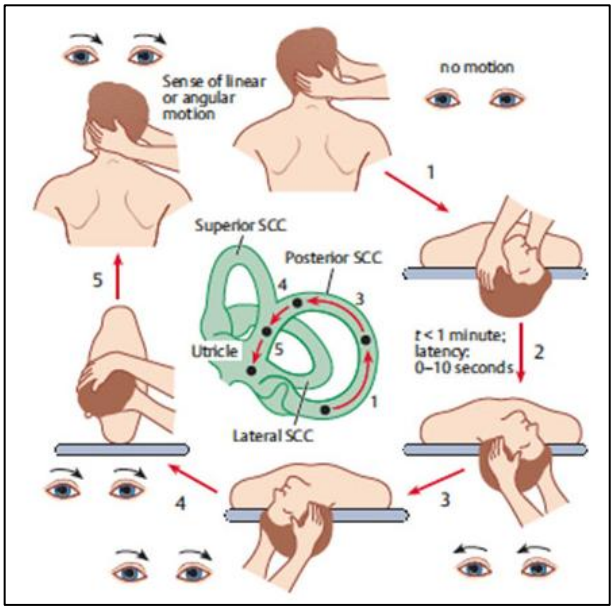

Figure 3.8: Epley maneuver [22]

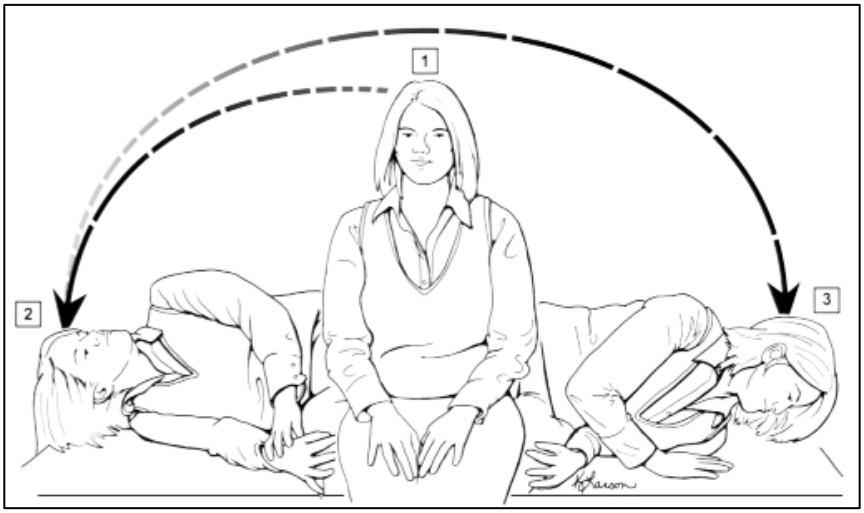

Figure 3.9: Semont Maneuver [23]

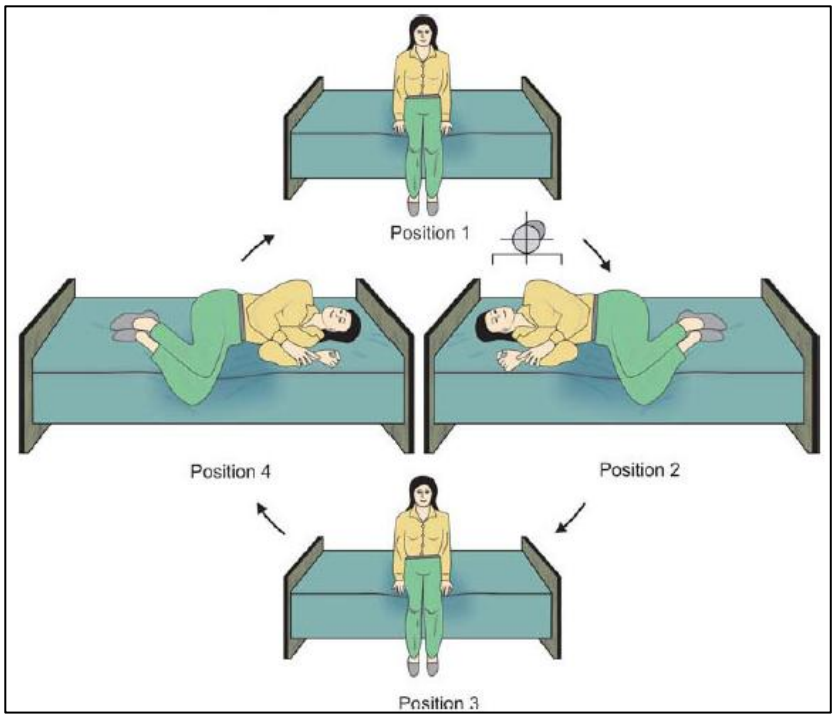

Figure 3.10: The Brandt-Daroff exercise [24]

4. Customer Value Drivers (CVD)

The NBR offers different solutions to each of the four customer bases identified in Section 2, so the customer value drivers for each base will be different.

4.1 Hospital Administrators

4.1.1 Brand Value

The NBR brand value will be largely unknown to hospital administrators, although they will most likely be aware of other vertigo treatment devices on the market. They will see in market literature that this device uses the same or similar treatment methodology.

4.1.2 Design Value

The appealing design value to the hospital administrator is that this device would take up much less valuable floor space in their hospital/clinic. Effective use of clinic space to maximize patient positive outcomes is important to this group.

4.1.3 Cost vs. Benefit Value

A comparison of the cost of the NBR device versus current devices and treatments currently on the market show is very important to hospital administrators. The new NBR device is $24,000 while the original Epley Omniax chair was $120,000. At approximately one-fifth the cost of the Epley Omniax, the new device is also much smaller.

4.1.4 Technology Value

Similar to brand value, administrators will see through marketing material or through sales presentations that the NBR device operates with advanced technology. The technology will be demonstrated and the sales team will show the expected life cycle of this device.

4.1.5 Convenience Value

The convenience value will be found by the portability of the device. Because this device is portable it can be taken to people who otherwise would not have their vertigo treated. This is a much smaller device allowing multiple units to be used within the footprint of larger devices currently on the market. Both of these qualities allow the NBR to treat more patients and increase revenue to the hospital/clinic.

4.2 Insurance Companies

4.2.1 Brand Value

Brand value to insurance companies will not be apparent initially because the product is not available on the market. This NBR medical device will receive the required Food and Drug Administration and Underwriters Laboratory approvals as a medical device and for electrical/product safe use on people.

4.2.2 Design Value

Design value to insurance companies will not be an important consideration for this group.

4.2.3 Cost vs. Benefit Value

A comparison of the cost of the NBR device versus current devices and treatments currently on the market would be of high importance to the insurance market class. They will be able to see that the NBR is $24,000 compared to the next effective vertigo treatment device, Epley Omniax, at $120,000. This will show them that more clinics can afford this device and treat more patients, which reduces vertigo-related work absenteeism and degrades quality of life. With the increased efficiency in treating patients, as compared to manual maneuvers, patients will need fewer visits to treat the same problem which reduces the payments insurance companies pay.

4.2.4 Technology Value

Similar to design value, insurance companies will not see the technology value other than this technology will allow more patients to be seen and effectively treated for vertigo.

4.2.5 Convenience Value

The convenience value will be found by the portability of the device. Because this device is portable it can be taken to people who otherwise would not have their vertigo treated. This allows more patients to be treated, more patients treated means better quality of life and less work absenteeism.

4.3 Practitioners

4.3.1 Brand Value

Dr. John Epley was the founder of the Epley maneuvers used to alleviate vertigo in patients. Our Nystagmus-Based Repositioning device would be able to tap in the customer base this brand due to the Epley Omniax product history, and that the installed Epley maneuvers are the leading maneuvers in treating vertigo.

4.3.2 Design Value

Value attributed to the design of the NBR device is generated by factors that appeal to the customers. Being a small device that is wearable and not overly cumbersome for practitioners and their assistants to use makes it highly sought after. The competitors in this treatment are larger devices that require more physical space to perform the maneuvers. The attribute of being small allows practitioners the ability to have this device in smaller office settings or even allow the device to travel with them on home visits. This product package will include a laptop that uses a similar software interface as the Epley Omniax, which will be easier for the users to adapt to and begin using right away with limited training time needed.

4.3.3 Cost vs. Benefit Value

A comparison of the cost of the NBR device versus current devices and treatments currently on the market is very important to practitioners, especially ones who own their own private practice. The new NBR device is $24,000 while the original Epley Omniax chair was $120,000. At approximately one-fifth the cost of the Epley Omniax, the new device is also much smaller and has limited capabilities with reference to performing maneuvers (the Epley Omniax can rotate 360^{O}).

Other benefits include the following:

1. Ability to record eye movement for future reference so the doctor can validate the efficacy of the vertigo treatment and whether follow-up visits will be needed.
2. Software allows practitioners to orient the head in any way they or the patient prefers and feels comfortable.

3. Treatment can be offered at the patient site; for disabled patients this enables them to afford a practitioner visit.
4. Ease of use allows assistants to operate the device without doctor supervision, which reduces the amount of time they spend with each patient. This allows for better time management resulting in more profit to the clinic and savings to the patient.

4.3.4 Technology Value

The value of technology for this product is that it includes a head-tracking component, allowing for more accurate maneuvers. Sensors in this device allow for the ear canals to be tracked in real time and have the eye movement during the process recorded for later viewing and diagnosis of treatment efficacy.

4.3.5 Convenience Value

The convenience value will be found by the portability of the device. More practitioners will be able to afford this, which means more vertigo patients will have access to treatment and not have to be put on the waiting list for the Epley Omniax (which is only available in 30 cities in the United States).

4.4 Patients

4.4.1 Brand Value

Brand value to patients is not a concern for this market as they do not know about the NBR or other device brands; their main concern is to receive effective treatment.

4.4.2 Design Value

The unique design value of this product is that it does not confine a patient to a chair with tight straps to move their body in three-dimensions to treat their vertigo. Treatment can be offered at the patient site; for disabled patients this enables them to afford a practitioner visit.

4.4.3 Cost vs. Benefit Value

The patient is most likely not going to be aware of the cost of this device to their clinic; their savings will come in the form of reduced cost for treatment. There is a social benefit that affects not only the patients but their employers and the general public as taxpayers: with more efficient treatment patients will miss fewer days of work due to vertigo.

4.4.4 Technology Value

The technology value is most likely going to be made aware to the patient by the practitioner during the treatment, and they will see the value for themselves with the integrated technology this device offers for treatment.

4.4.5 Convenience Value

The convenience value will be found by the portability of the device. More practitioners will be able to afford this, which means more vertigo patients will have access to treatment and not have to be put on the waiting list for the Epley Omniax (which is available in only 30 cities in the United States).

4.5 Value Driver Chain Effect

As this new treatment for vertigo enters the market, we will need to be aware of the value drivers for putting the NBR into the hands of practitioners. Marketing appropriately to insurance companies will allow hospital administrators to feel good that the NBR can be used in their clinics and can be billed against insurance.

Marketing appropriately to hospital administrators will show them how it is effective at treating vertigo, costs 80% less than the Epley Omniax, and takes up much less physical space. Marketing appropriately to practitioners will show them how they can use our advanced technology package to effectively treat vertigo, save practitioner time, treat more patients, and see through the value chain buy-in from everyone above them: the hospital administrators and insurance companies.

This value driver chain effect is happening because there is a gap in the market where patients were not always able to receive vertigo treatments, practitioners did not have access to a device that would make sense for their clinic, administrators could not justify the expensive cost and space requirements of competitors, and insurance companies could not help everyone with vertigo—usually those patients local to where a vertigo device is available were treated.

4.6 ROI

The return on investment for buyers of the NBR device is 3.5 months, compared to about 1.5 years for the Epley Omniax. This assumes that the hospital/clinic operates the device 75% of the time. Calculations are attached in Appendix E.

5. Compelling Reasons to Act (CRTA)

Interviews with a neurotologist, audiologist, and physical therapist improved the team's understanding of the need for a compact device for practitioners who perform Epley maneuvers on patients diagnosed with benign positional vertigo (BPPV). An interview was also conducted with a patient who suffers from BPPV and is treated with manual Epley maneuvers by her sister, a physical therapist, who is also diagnosed with BPPV. (These sisters perform manual Epley maneuvers on each other.) All of the interviewees expressed a strong desire for a portable device that would increase the efficiency of performing manual maneuvers and increase the accessibility of receiving treatment to an increasing population of BPPV patients. (There are approximately 8,000 elderly patients per day who reported a problem with dizziness or imbalance associated with vertigo [25].)

The results of the survey conducted (see Section 2.5 for details) showed that affordability and reliability and integrity were the two top ranking attributes that contributed to a practitioner's decision to purchase a portable Epley maneuver device. We believe these are the most compelling reasons why practitioners would act on purchasing this device, along with the growing need to be able to treat the growing numbers of patients diagnosed with BPPV.

It is important to note that for each customer base identified in Section 2, each will have their own compelling reason to act (CRTA) on using the NBR device. The following table lists the CRTA for each customer base.

Table 5.1: CRTA for each customer base

Customer Base	CRTA
Insurance Companies	The NBR offers an effective and efficient treatment option for patients, which will reduce the number of visits for BPPV treatments. This device offers a solution to insurance companies to reduce payments for BPPV treatment.
Hospitals/Clinics (Administrators & Doctors)	The NBR offers an affordable, effective, and efficient treatment option for patients diagnosed with BPPV. Improved treatment options reduce patient liability and promote a better quality of life for patients. This device offers a portable solution to treat the ever-increasing numbers of BPPV patients.

Customer Base	CRTA
Private Practitioners	The NBR offers an affordable, reliable, and compact device to effectively and efficiently treat patients diagnosed with BPPV, in turn, reducing patient liability. This device offers the most cost effective solution to increase the quality of life of BPPV patients.
Patients	The NBR offers an effective and efficient treatment option that will reduce your return visits for BPPV treatment, improving your overall quality of life and reducing out-of-pocket medical expenses. This device offers a solution to the need for effective and efficient treatment that is convenient and affordable.

6. Value Proposition

The NBR offers different solutions to each of the four customer bases identified in Section 2. Each customer base has a corresponding value proposition targeted specifically toward the respective population.

6.1 Value Proposition for Insurance Companies

"We help insurance companies improve their bottom line by offering an affordable device for hospitals and private practitioners to purchase. The increased efficiency and accuracy the device gives practitioners in treating patients diagnosed with vertigo will reduce the number of return visits for each patient, which will in turn reduce the number of insurance payments made for each patient."

6.2 Value Proposition for Hospital/Clinic Administrators

"We help patients diagnosed with BPPV by introducing NBR, which is significantly less expensive than the Epley Omniax. The NBR device has a lightweight camera, is portable, and is comfortable for young and older patients. NBR customers benefit from the increased flexibility and ease of use of our product with the same advanced technology used in the Epley Omniax. Our device supports head orientation tracking, unlike VF405, and has the capability of changing from a single- to double-vision camera. The NBR device also has a software-controlled light, unlike the Epley Omniax. Our device helps medical staff by providing the view of elapsed testing time unlike the VF405. For customers who need the same level of reliability and integrity of the Epley Omniax in a compact device, the NBR device delivers quality at an affordable price."

6.3 Value Proposition for Practitioners

"We help medical practitioners more efficiently and precisely treat patients with vertigo by providing a reliable and affordable device. Unlike the VF405, NBR increases

precision in performing maneuvers with the added head-tracking component. Compared to the other devices, NBR occupies less space for operation than Epley Omniax, Gyrostim, TRV Chair, and Neuro Kinetic rotary chair."

6.4 Value Proposition for Patients

"We help patients diagnose with BPPV a more accessible alternative to receiving treatment for vertigo. Our device offers an option to treatment that is less physically and psychologically overwhelming. This device will not only decrease out-of-pocket expenses by offering a more accurate and effective treatment option reducing return visits, but increases a patient's quality of life."

7. Positioning the NBR in the Market

As a team, we tried to compare NBR with the competitors in the market. NBR is the only device with infrared video goggles and proprietary software with 3-D real-time monitoring and measurement of nystagmus (eye movement) and spatial orientation of the patient's semi-circular canals in the ear.

NBR is a critical component of any treatment center devoted to excellence in diagnosis and rehabilitation of balance and dizziness disorders. Its maneuvers menu assists in precise treatment for an improved level of analysis and decision-making in future treatment plans. The state-of-the-art high-resolution cameras provide clear nystagmus tracking. The software's ability to record data and video gives a practitioner the ability to more effectively monitor a patient's progress over time with customize reporting, which improves the level of care the practitioner is able to provide. These features make NBR the most high-tech portable device for treating vertigo.

The NBR device was developed under the guidance of Dr. John Epley, who is recognized for the "canalith" theory as the cause of BPPV and for "canalith repositioning maneuvers" as its treatment. Based on Dr. Epley's experience and knowledge, NBR makes it possible for others in the medical community to benefit from his decades of research and understanding of the vestibular system.

The following figures give a visual illustration of the position of the NBR compared to its competitors. While the DizzyFix is the leading device for price and size, its weakness is that it does not have any of the features of the other devices. From the figures below

you can see that the NBR device is the leader when considering affordability, portability, and features.

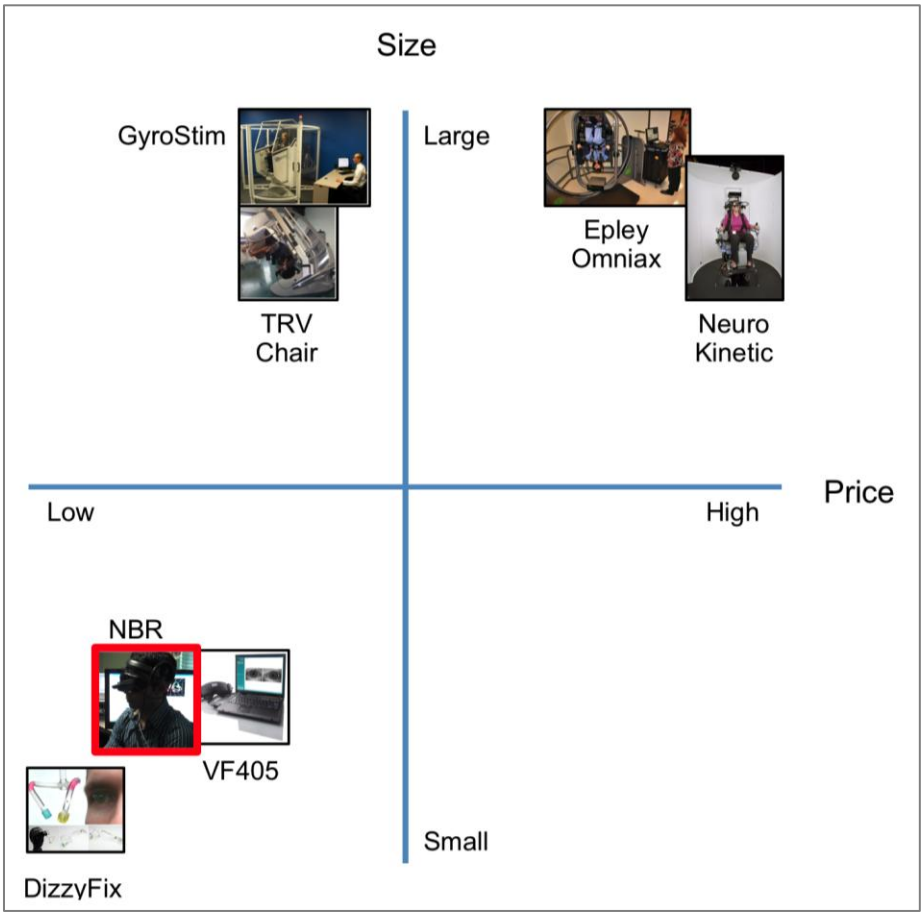

Figure 7.1: NBR position considering price and size

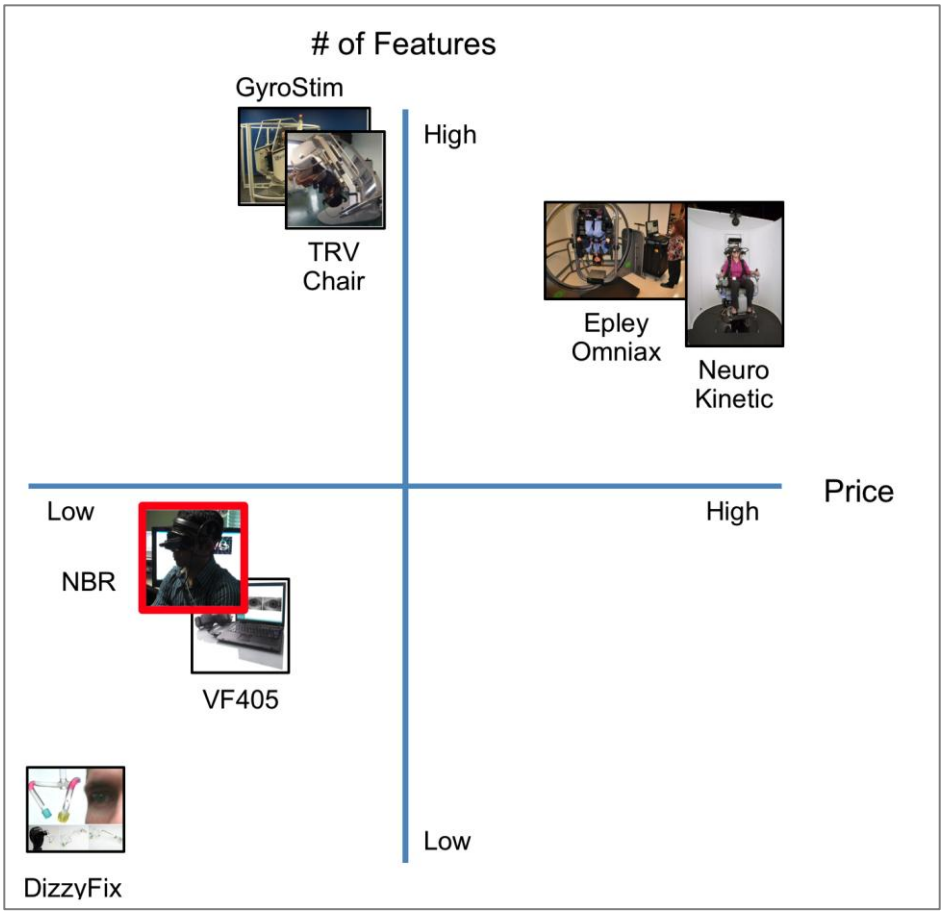

Figure 7.2: NBR position considering price and number of features

8. NBR Product Package

Vesticon will be offering a complete package to our customers for the price of $24,000 that will include the items listed below in Tables 8.1 to 8.3.

Table 8.1: Hardware Package

SNo	Description
1	Complete headset with accelerometer
2	Camera set with one camera
3	Goggles for camera
4	Pre-configured laptop for NBR use only
5	Software installation disk (additional)
6	Windows operating system installation disk
7	Firewire cable set

Table 8.2: Training Package

SNo	Description
1	One-day operators training from certified professionals to get hands-on experience
2	One-day clinical training from reputed clinician to learn full utilization of NBR capability

Table 8.3: After Sales Warranty and Support Package

SNo	Description
1	NBR package comes with 1-year warranty*
2	Three-tier service program will be offered to customers
3	On-site service will be available upon request

*Warranty does not include damage to the device caused by user negligence.

8.1 Service Levels

The three-tiered service level of support will be developed so that customers can have levels of support based upon their needs. These service levels may be further developed as the start-up grows.

Level 1: For companies wanting a significant amount of handholding service and support for the NBR device there will be a group of technicians to provide this.
Level 2: Call center support during work hours.
Level 3: FAQs and web-based support tutorials.

These support and service levels will be directed by a customer experience program manager with support from the design engineers who will be available periodically to answer technical questions.

Because people and resources for a dedicated service team will be very limited initially, it may be more effective if the higher levels of support services (Levels 1 and 2) are held over until sales and profits can be formulated. If the start-up receives venture capital funding it is possible that all three service levels can be initiated.

Warranty support will be handled at the Level 2 support tier by the call center.

9. Marketing Plan

9.1 Positioning Statement

NBR is the new standard of care in the assessment and treatment of positional vertigo associated with BPPV disorders. This comfortable positioning allows the treatment to be less psychologically and physically overwhelming and allows for a straightforward treatment plan for the patient.

9.2 Competition Strategy

Figure 9.1 depicts Porter's Five Forces for launching the NBR device to the market.

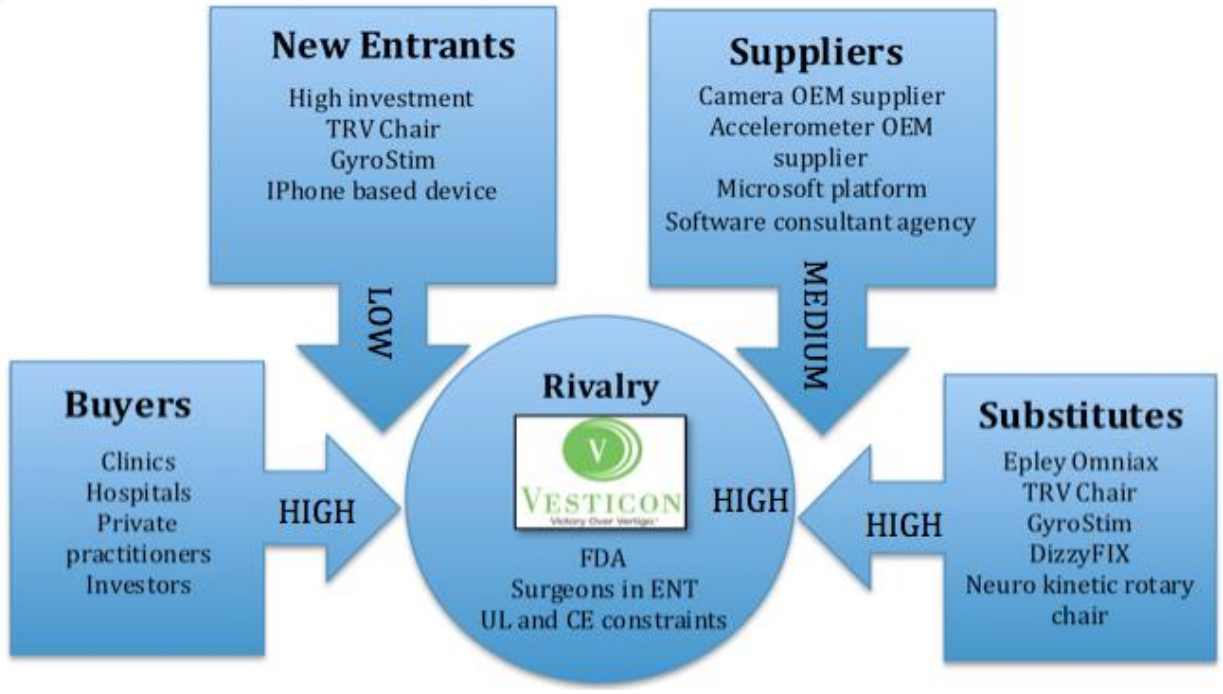

Figure 9.1: Porter's Five Forces

Threat of New Entrants

Vesticon has a well-established brand and customer loyalty that provides a platform to introduce NBR as a derivative of the well-known rotary chair Epley Omniax to the market. Vesticon owns the patent for this technology and device architecture. It already has a working prototype that is 90% complete with some software bugs to fix. If we launch in the next year we will be able to capture most of the market before our competitors make their move in this segment and assess the competitive and customer environment combined with a technology assessment. This will assist in defining the business objectives of each new product.

We can always be the market leader and will be able to define the next product generation. New entrants or established companies such as Neurocom and Interacoustics can also bring some competition to the market by launching a similar product. New companies will require a lot of resources and a recognized brand name in the industry, as initial sales will be based on in-person communications with the doctors and other practitioners who will operate this device. It took Vesticon two years to develop software when they already had a prebuilt software platform for the Epley Omniax. Another barrier to competitors is getting FDA approval, which requires clinical trials by reputable practitioners. This requires strong personal and professional relationships besides a lucrative incentive to do study for a product. Therefore, *the degree of threat of new entrants is considered to be low.*

Bargaining Power of Suppliers

This is a one-of-a-kind of device that can be helpful for a lot of customers who perform manual maneuvers without reduced accuracy. Vesticon as the corporation has to deal with some suppliers to make this product feasible to enter the market. Some of the major suppliers are identified in the table below. *The degree of bargaining power of suppliers is considered to be medium.*

Table 9.1: Major Suppliers for NBR Device

Parts Description	Supplier	Substitutes, if any	Threat level
Camera	Point Grey, Inc.	Riftek, Matrix Vision	Low
Accelerometer	Xsens	Intersense and others	Medium, as we already developed software with their software development kit.
Windows Microsoft	Microsoft	None, unless we plan on investing a lot of money in software development to make it compatible with Linux.	High, as Microsoft keeps changing the operating system platform (current OS is XP, which is obsolete). More investment in software upgrades will be required.
Software Consultant	Tera Technologies	Some, but other software companies will require more time and more effort to come up to speed to upgrade the software on time, which might impact our competition. This software company has already built the platform and has all the resources.	Medium. Changing the software technology firm might cost more money and cause delays in project deliverables, which will impact finances and our reputation in the market, leading us to lose our market share and leadership.

Bargaining Power of Customers

The bargaining power of the customer will rely on the value gained from the product, affordability versus the need and options/solutions to the problem available in the market. Some of the bargaining power of the customer can come from:

- Practitioners perform manual maneuvers on the patients, which gets them the same reimbursement even if patients are not getting treatment to its full potential, which depends on the accuracy and precision of performing the maneuvers. These practitioners may not be willing to spend money unless demand come from the patient.
- Insurance companies may ask for some kind of package deal for them to get financial or other benefits.
- Larger hospitals or investors willing to buy the NBR in large quantites to open a separate dizziness center specializing in vertigo treatment may ask for discounts or a special annual maintenance service package.
- There is a high investment for hospitals to purchase the machine with additional costs and high switching costs from their existing system to the new diagnostic machines. Hospitals and clinics may not consider other alternatives.

Therefore, *the degree of bargaining power of customers is considered to be high.*

Threat of Substitute Products

There can be a lot of substitute for vertigo treatment such as Semont maneuvers and manual maneuvers. These are also option for customers, who are uncomfortable while performing procedures with the new machines. Also, Diagnostic machines that can operate on eye-tracking motion might be options for hospitals and clinics' considerations such as VF405 and DizzyFIX, *therefore, the degree of threat of substitution products is considered to be high.*

Threat of Rivalry

We consider rivalry as the parties whose actions might cause some adverse effects to our product. Some of the major threats seem to be:

- Gyrostim and the TRV chair are getting released around $50,000, and their money vs. customer value will be very important in this rivalry analysis.
- ENT surgeons, who make money from the surgical treatment of vertigo, are a rivalry threat as we are building competitors for them.
- Any electrical device that comes into contact with a patient's body has to pass UL *(*Underwriters Laboratories*)* certification that includes leakage current test,

radiation test, ESD test and so forth, which might be a potential threat for current or future NBR development.

- Rivals can try to defame NBR as a product by showing unproven (hyped up) failures in the field or patient injuries as a result of coming into contact with the device in order to hurt the reputation of the product in the market.
- DizzyFIX is one of the major rivals due to its low cost around $150, which is equal to the price practitioners charge to the patient for one 1-hour clinical visit.
- Epley Omniax may be the direct competitor to the second smaller version because some rich-resource hospitals and clinics that already bought the Epley Omniax may not consider purchasing a new machine.

These are some rivals, which can inevitably impact Vesticon's sales growth: t*herefore, the degree of threat of rivalry is considered to be high.*

9.3 Distribution Strategy of the NBR

Direct distribution channels will be used initially as this is a start-up with little infrastructure in place. The distribution channel will be based upon a small regional sales force visiting the larger hospitals and vertigo treatment centers to demonstrate the vertigo device with practitioners already familiar with the Epley maneuvers. Finding practitioners with this experience will be critical and ensuring that the sales force members understand Epley maneuvers will enhance the presentation performance.

The direct, personal sales approach is appropriate in this instance because this is a product that is different from other competitors; it has a unique technology mix that allows easier and more effective treatment of vertigo, and is much less costly compared to competitors. This is a typical sales tactic for medical device sales.

With the direct sales and direct distribution approach the NBR device can be directed towards large customers initially with growth coming from trickle-down word of mouth. Vesticon will advertise in medical device journals and sales leads will be tracked using customer resource management software to more easily track them based on geography, clinic size, etc.

The sales team will be paid on commission and a percentage of service level fees paid in advance.

The distribution channel will be centralized to Portland, Oregon, as the start-up's base of operations. The manufacturing of the device may come from other partners that make

the sensor, eye recorders, software, and laptop system. Assembly will happen in Portland as will distribution to the sales teams and large purchase orders.

9.4 Pricing Strategy for the NBR

NBR is a device that will attract a customer segment that has previously not been involved in vertigo treatment, and the cost will be much lower compared to competitors. The NBR device is designed and aimed to minimize the cost to the customer, making it more affordable to a bigger audience.

The base price of the NBR is dependent upon amortization of all the research and development and overhead costs to get the device on the market.

We have assumed that the product life cycle is four years. The calculations consider a 5% market share from the ENT and 2% from the physical therapy fields in the first year, which equates to 1,540 practitioners from ENT and 6,452 from physical therapy. This is based upon a total available market of 24,800 neurotologists, 2,400 otolaryngologists, and 3,600 physicians based upon 2006 statistics [5], with approximately 240,935 physical therapists and 81,691 physical therapy assistants within the U.S. based on 2009 statistics [6]. We also forecast a growth of 5% in both market areas for the NBR over the four-year period.

The unit cost of the NBR device on its own is $5,039.46. When including the training package and communication strategy budget, the unit price increases to $6,240. For details on calculations, please see Appendix C.

Pricing Considerations

Value-based pricing is predicated upon an understanding of customer value. In order to gain this understanding we did primary research that included devaluation of customer operations, interviews with customers, and a survey conducted with practitioners to determine value a customer attributes to a product or service. To help in determining the price, a matrix was used to rate the customer value drivers indicated in Section 2. The matrix is attached in Table C.4 in Appendix C.

We introduce the product for $24,000 in the market. The $24,000 price was arrived at by considering the Epley Omniax chair that sells for $120,000, pegging our product at 20% of the cost of that device.

This analysis shows that NBR offers many different value drivers to the prospective customer in every aspect, so $24,000 will be our introductory price. This will give us a cushion to manipulate the market competition if a new product enters the market with a competitive price and/or features or our current competitors reduce the prices of their products to become a major threat to our market share.

9.5 Communication Strategy for the NBR

The communication strategy for marketing this device will depend heavily on developing relationships with medical practitioners due to the NBR's position on the Technology Adoption Lifecycle Curve (TALC). In order to reach the early adopters who will be the first buyers of this device, we will need to reach out to them individually, face-to-face or by phone/email, to gain their interest in and support of this product. We will rely on those initial customers to help us reach out to their colleagues in the medical field.

The target audience for this communication strategy are medical professionals: neurotologists, audiologists, physical therapists, chiropractors, otolaryngologists and their respective assistants; administrators; health insurance companies; and medical device distributors.Hospital administrators and investors who have the resources to invest in technology may have an interest to invest in creating vertigo centers; those are individuals who are also part of the target audience. VA clinics are also part of the audience, since vertigo is a common diagnosis for veterans, and VA clinics are not registered as private hospitals are. The general public is also included because though one may not be diagnosed with vertigo, they may know someone who is and can refer them to this technology.Assisted living and retirement home are also a great place to advertise the NBR, since treatment for vertigo is critical for older patients as a preventative measure (e.g., and elderly patient may fall and break bones if their vertigo is not treated effectively).

The tactics that will be used to reach these audiences will be a combination of face-to-face interactions; phone/email communications; print materials; news media; and an Internet presence including a website, webinars, blogs, and social media outlets, as illustrated in Figure 9.2. Messages will be geared toward each audience, and we will use consultants to help frame the messages. For example, we may consult with a social worker who works mainly with elderly patients to assist in framing a message toward assisted living or retirement homes. The message could be framed around the ability to live an independent live, but delivered in a way that is respectful to older individuals.

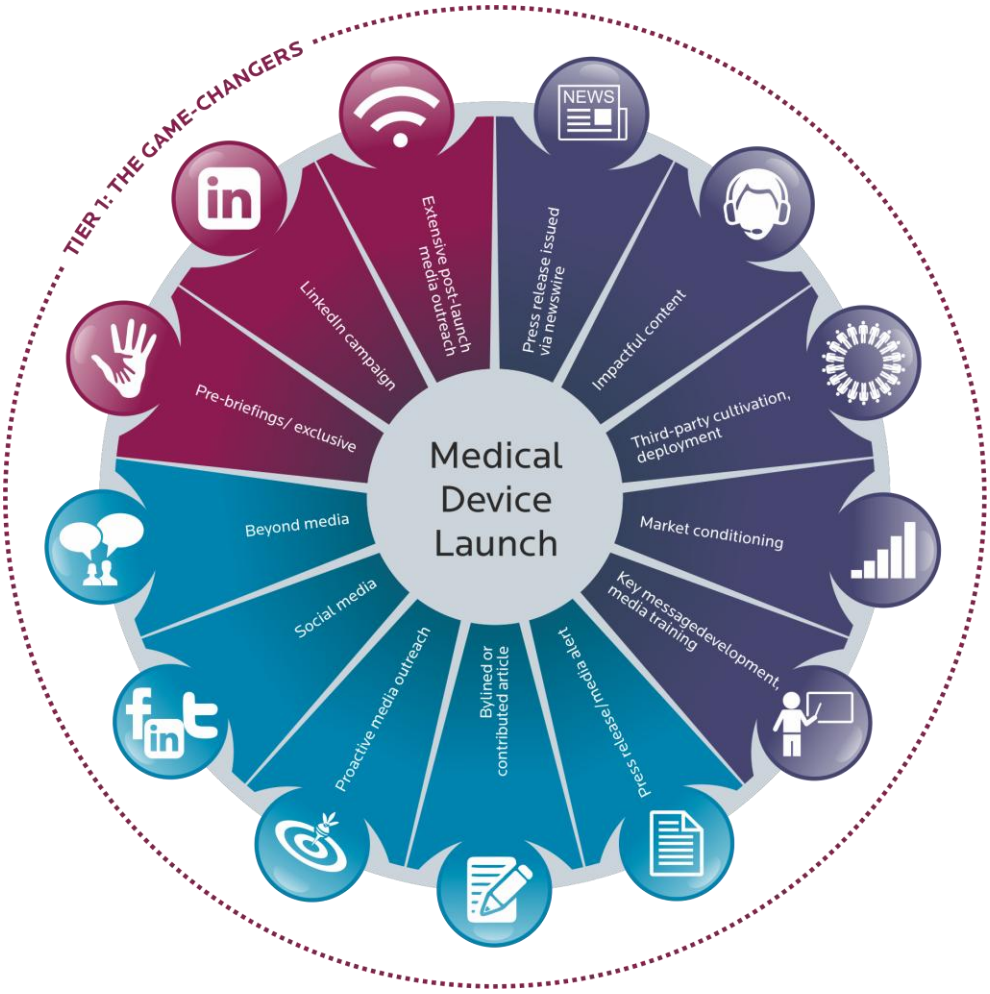

Figure 9.2: Communication strategy for medical device launch [26]

Face-to-face interactions with potential customers will occur at various medical professional association conventions and medical expos across the United States and overseas, such as the American Academy of Otolaryngology-Head and Neck Surgery Foundation Annual Meeting and Expo (AAO-HNSF Annual Meeting & OTO EXPO), a program which offers otolaryngologists and other interested health professionals a series of unique and dynamic education experiences designed to broaden and enrich their understanding of otolaryngology—head and neck surgery—and to provide a foundation for continued learning. The program format, including scientific sessions, instruction courses, mini-seminars, and posters, will help medical companies maintain an awareness of new accepted methods of diagnosis and treatment, and will provide updates on new developments in the field [27].

Other face-to-face tactics will include reaching out to medical professionals individually through office visits and hosting events where individuals are invited to witness a live demonstration of the NBR device and have an opportunity to test the device.

Other modes of communication will include webinars and DVD demos. We plan to partner with professional associations for neurotology, audiology, chiropractic and physical therapy, and otolaryngology (e.g., American Chiropractic Association, American Physical Therapy Association) to host webinars, or post them on their respective websites, demonstrating the benefits and how to use the NBR device. We will also have a presence on the web through a website, social media (e.g., Facebook, Twitter, LinkedIn), and medical blogs (e.g., Medical Device Depot, http://www.physiciansequipmentblog.com/; QuickMedical, http://www.quickmedical.com/blog).

Outreach to media outlets is a tact that will also be utilized. Press releases will be developed and launched through the professional association partnerships. News media will be invited to live demonstrations of the device to gain video coverage, as was done with the Epley Omniax.

Table 9.2 is a matrix showing the methods of communication we will use for each of the targeted audiences.

Table 9.2: Communication Tactic-Audience Matrix

	Office Visits	Expos/ Conferences	Email	Phone	Website	Webinars	DVD Demo	Blogs	Social Media	News/ Radio	Print
Hospital Administrators	X	X	X	X	X	X	X	X		X	X
Investors	X	X	X	X	X		X	X	X	X	X
Medical Professionals	X	X	X	X	X	X	X	X		X	X
Clinics	X	X	X	X	X	X	X	X	X	X	X
VA Medical Centers	X	X		X		X	X	X		X	X
Retirement/ Assisted Living Homes	X			X	X		X			X	X

	Office Visits	Expos/ Conferences	Email	Phone	Website	Webinars	DVD Demo	Blogs	Social Media	News/ Radio	Print
Health Insurance Companies		X	X	X			X			X	X
Medical Device Distributors	X	X	X	X	X		X	X		X	X
General Public					X				X	X	

The communication strategy budget consists of travel costs for conferences and office visits, and development for a website, training DVD/webinar, and print materials. The total cost, approximately $152,000, has been integrated into the product price. The table of calculations is in Appendix D.

9.6 NBR Sales Forecast

The NBR device will be sold within the United States after approval by the Food & Drug Administration (FDA). The current product schedule involves:

- Development of prototype devices for testing by the FDA. June 2013 prototype done.
- Testing by the FDA. During this process, put on retainer a sales and marketing force to market to the large hospitals and vertigo treatment centers. Duration of one year, end date mid-2014.
- Send out sales force across the country. Mid-2014.

The sales forecast is based upon a growth of 5% within the subgroups of neurotologists and physical therapists. The base of customers is described within Section 2. A conservative growth rate of 5% was chosen to represent the adoption by this group of practitioners within their clinics. Figure 9.3 shows the sales and profit growth during the first four years of operation.

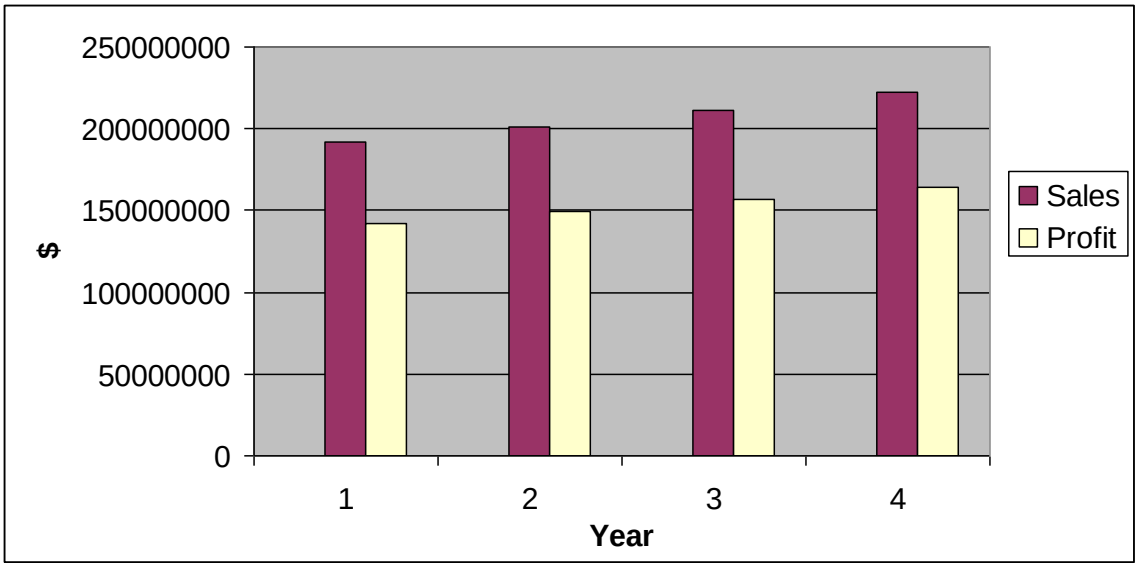

Figure 9.3: Four-Year Sales Forecast

10. Conclusion

The Nystagamus-Based Repositioning Device is a piece of medical equipment that will revolutionize the treatment for vertigo in the United States. This device employs a vertigo treatment maneuver called the Epley Manuever, which is used widely; however, there are only a few approved medical devices that can perform Epley maneuvers with confirmed results. These current devices typically take up an entire room and cost $40,000 to $150,000. Because other options are so expensive, not as many hospitals can afford the more expensive devices, which reduces the number of patients that can be treated each year.

This marketing plan demonstrates that a concerted effort to target hospitals (administrators and practitioners) and private clinics through direct marketing. Marketing this device as an affordable option will enable doctors to purchase the device and be able to treatment vertigo with more confidence; enable practitioners to reach more patients so that patients can get the treatment they need to live better lives; and enable administrators to see a solid payout by adding this device to their inventory.

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Appendices

Appendix A: Glossary

Audiology: Hearing is one of our most vital senses, and audiologists are experts in the non-medical management of the auditory and balance systems. They specialize in the study of: normal and impaired hearing, prevention of hearing loss, identification and assessment of hearing and balance problems, rehabilitation of persons with hearing and balance disorders, and dispense hearing aids and hearing assistive technology systems. (Source: http://www.asha.org/careers/professions/audiology/)

BPPV: Benign paroxysmal positional vertigo

Chiropractic is a health care profession that focuses on disorders of the musculoskeletal system and the nervous system, and the effects of these disorders on general health. Chiropractic care is used most often to treat neuromusculoskeletal complaints, including but not limited to back pain, neck pain, pain in the joints of the arms or legs, and headaches. (Source: http://www.acatoday.org/level2_css.cfm?T1ID=13&T2ID=61)

CRP: Canalith repositioning procedure

ENT: Ear, nose, and throat

NBR: Nystagmus-based repositioning

Neurotology is the study and practice of medical and surgical disorders that involve the ear, adjacent brain, and the nerve connections within this region (known as the lateral skull base). In addition to all disorders of hearing and balance, neurotologists also treat disorders of the facial nerve, tumors of the inner ear and skull base, and abnormal connections between the brain and temporal bone. In actuality, the meanings of the terms otology and neurotology overlap quite a bit. Nevertheless, a neurotologist's training provides the ability to treat disorders, ranging from simple to complex, that involve the area of the temporal bone and lateral skull base. (Source: http://www.jhbi.org/what-is-neurotology/)

Otolaryngology (pronounced oh/toe/lair/in/goll/oh/jee) is the oldest medical specialty in the United States. Otolaryngologists are physicians trained in the medical and surgical management and treatment of patients with diseases and disorders of the ear, nose, throat (ENT), and related structures of the head and neck. They are commonly referred to as ENT physicians. (Source: http://www.entnet.org/HealthInformation/otolaryngologist.cfm)

Physical therapy is a type of treatment you may need when health problems make it hard to move around and do everyday tasks. It helps you move better and may relieve pain. It also helps improve or restore your physical function and your fitness level. The goal of physical therapy is to make daily tasks and activities easier. For example, it may help with walking, going up stairs, or getting in and out of bed. (Source: http://www.webmd.com/pain-management/tc/physical-therapy-topic-overview)

PT: Physical therapist

PTA: Physical therapist assistant

SAM: Served available market

SOM: Share of the market

TAM: Total available market

UL: Underwriters Laboratories

Appendix B: Calculations for TAM, SOM, and SAM

Assumptions:

- Market growth is constant
- 5% annual market share growth
- 20% of market captured by competitor
- Share of the market is 80% of total available market

Total Available Market

TAM = ENT(3,600+2,400+12,000+12,800)+ PT(240,935+81,691)
= ENT(30,800)x80% + PT(322,626)x80%
= 24,640+258,100
= 282,740

Share of Market

SOM = 80% of TAM
= (19,712)+(206,480)
= 226,192

Served Available Market

1st year SAM = 5% (ENT) +2% (PT)
= 1,540 + 6,452
= 7,993

2nd year SAM = 1,617+ 6,775 = 8,392

3rd year SAM = 1,698 + 7,114 = 8,812

4th year SAM = 1,783 + 7,470 = 9,252

Appendix C: Pricing Strategy Calculations

Table C.1: Sales Forecast

Year	Doctors	PT & PTAs	% Doctor	% PT	TAM Doctors	TAM PTAs	Market Growth	Market Size
1	30,800	322,626	0.05	0.02	1,540	6,453		7,993
2	30,800	322,626			1,617	6,775	0	8,392
3	30,800	322,626			1,698	7,114	0	8,812
4	30,800	322,626			1,783	7,470	0	9,252

Table C.2: Base Price Build-Out

Description	Actual Cost of Product Development	Overall Cost	Product Life Cycle Cost
Initial Software Development Cost	$200,000	$200,000	$800,000
Expected Product Development Cost	$600,000	$600,000	$24,000,000
Liability Insurance / Year	$2 per device up to 10,000 units	Assuming sales forecast and corresponding insurance costs Y-1: 7,993 units = $15,985 Y-2: 8,392 units = $16,784 Y-3: 8,812 units = $17,623 Y-4: 9,252 units = $18,504	$68,897
FDA Control Study w/ Consultant Fees/ Year	Approx $10,000/year	$10,000	$40,000
Patent Maintenance Fees	$10,000	$10,000	$40,000

Description	Actual Cost of Product Development	Overall Cost	Product Life Cycle Cost
Legal Retainer	$40,000/year	$40,000	$160,000
Further R&D Cost Including Payroll of R&D and Engineers	$1,000,000	$1,000,000	$4,000,000
Overhead including County Tax, Federal Tax, Payroll Taxes, and Utilities	$400,000	$400,000	$1,600,000
Shipping	$50/unit	7,993 x $50 = $399,626	$1,722,438
Packaging	$5/unit	7,993 x $5 = $39,963	$172,244
OEM Camera Point Grey	$400/unit	7,993 x 400 = $3,197,008	$13,779,504
Camera Hardware Cost w/ Goggle	$600/unit	7,993 x 600 = $4,795,512	$20,669,256
OEM Head Tracker from Xsens, Inc.	$2,000/ unit	7,993 x $2,000 = $15,985,040	$68,897,521
Headrest	$200/ unit	7,993 x $200 = $1,598,504	$6,889,752
Computers (laptop)	$1,500/ unit	7,993 x $1,500 = $11,988,780	$51,673,140
Total		**$40,280,418**	**$166,806,400**

*The above values are estimates and based on previous experience.
Amortizing the product development cost over 7,993 products (sales forecast over the period of product cycle) = $40,280,418 / 7,993 = $5,039.46 per unit.

Table C.3: Clinical & Operators Training Package

Description	Total Cost	Cost Over the Product Life Cycle of 4 years
Clinical Trainer	$2,000/day or (10 candidate max from 7,993 unit sales)= $1,598,504/year	$6,889,752

Description	Total Cost	Cost Over the Product Life Cycle of 4 years
Travel Cost	$2,000/ 2 day trip = $1,760,000/year	$7,040,000
Training & seminar facility	$1,000/ 2 day trip = $880,000	$3,520,000
Total	$6,600,000	$17,449,752

Table C.4: Marketing and Communications Budget

Description	Product Life cycle cost	4-year Extended Cost
Sales Rep Bonuses Per 100 Product Demos	$400,000	$1,600,000
Communication/Sales Budget	$43,480	$151,909
Total	$443,480	$1,751,909

Including the sum of the clinical and operators training package and the marketing and communication budget brings the total product cost to $6,240/unit.

Table C.5: Pricing Strategy Matrix

☆ = represents the value to the customer, where 1 star represents the minimal value and 5 starts represent the highest value.

Item	**Description**	**Hospital & Clinic Management**	**Insurance companies and Medicare**	**Private Practitioners**
Total Cost of Ownership and ROI	Purchase price is at least 50% less than its nearest competitor and about 1/6 of the highest competitor. Close to VF405 but has extra features such as position precision and motion tracking.	☆ ☆ ☆	☆	☆ ☆ ☆ ☆ ☆

Space required for operation	At least 5 times smaller than any rotary chair and of equal size to VF405. Larger than DizzyFIX.	☆☆☆☆	☆	☆☆☆ ☆☆
Less liability and increased patient safety	Treatment by healthcare professional who is not relying on a machine to for operation and to support the patient as in rotary chairs, so there is less possibility of machine breaking down during treatment and injuring the patient.	☆☆ ☆ ☆ ☆	☆ ☆ ☆ ☆ ☆	☆☆☆ ☆ ☆
Quick and easy setup to save time to perform more maneuvers in one session	There is a limitation that fewer maneuvers can be done with this device as compared to a rotary chair such as the Epley Omniax. Setup time is almost the same with other competitors.	☆ ☆ ☆	☆☆ ☆	☆ ☆ ☆
Reliability and less downtime. Good service structure.	Less failure in the field due to fewer mechanical components and easy part replacement. If failure occurs, downtime will incur cost around failure and what kind of service is being provided from the manufacturer. Warranty plan is available for customers.	☆☆☆☆	☆	☆ ☆ ☆ ☆ ☆
Operator's and clinical training for proper and maximum usage of technology	Very detailed and hands-on training package will be provided with no additional cost to the customer from reputed doctor. None of our competitors have a competitive clinical training package.	☆☆ ☆	☆☆ ☆ ☆	☆ ☆ ☆ ☆ ☆

Appendix D: Communication Strategy Calculations

Table D.1: Domestic and International Medical Conferences and Expos

Event	Description	Audience
Annual Scientific Meeting of the Australian Society of Otolaryngology Head and Neck Surgery [28]	Head and neck surgery	ENT surgeons
American Medical Group Association (AMGA) Annual Conference [28]	Represents medical groups and organized systems of care	Medical professionals
Arab Health [28]	Healthcare exhibition	80,000+ medical professionals
Kuwait Medica Conference and Exhibition 2013 [28]	Healthcare oriented products, services, and processes for use in medical field	Medical professionals
American College of Physicians Internal Medicine convention [28]	Clinical and practice management topics	7000+ of America's internists, the nation's largest group of medical specialists
MEDICONEX Cairo Health [28]	Medical event that links science, technology, and business	Medical professionals, innovators, investors, administrators
China International Medicinal Equipment Fair (CMEF) [28]	Exhibition of medical equipment, related products, and services	Medical professionals, innovators, investors, administrators
Military Healthcare Convention & Conference [28]	Showcasing the latest military medical technologies	Medical professionals, innovators, investors, administrators
FIME International Medical Exposition, Inc. [28]	Exhibiting medical equipment	44,000+ attendees (medical professionals, innovators, investors, administrators)
American Chiropractic Association Chiropractic Summit [29]	National Chiropractic Legislative Conference and Education Symposium	500+ doctors of chiropractic, student doctors, chiropractic assistants and industry professionals
American Physical Therapy Association Annual Conference and Exposition [30]	National annual conference	Physical therapy professionals, assistants, students, and industry professionals
American Speech-Language-Hearing Association Annual Convention [31]	National annual conference	Speech-language pathologists, audiologists, and speech, language, and hearing scientists
American Academy of Audiology Conference [32]	National annual conference	Audiologists
Academy of Doctors of Audiology Convention [33]	National annual conference	Audiologists
American Neurotology Society Spring and Fall Meetings [34]	National annual meeting	Physicians, otologists, neurotologists, residents, fellows, researchers, nurses, occupational and speech therapists

Event	Description	Audience
American Academy of Otolaryngology Annual Meeting and Expo [27]	National annual conference	Otolaryngologists

Table D.2: Travel Budget [35], [36], [37]

One-year cost

	Conferences/Expos						Office Visits		
	International			Domestic					
	ASOHNS	Arab Health	AAO-HNSF	AMGA	DoD/VA	COSM/ANS	Seattle	Portland/Vancouver	San Francisco
Airfare	$2,000	$1,800	$300	$700	$500	$700			$200
Hotel	$1,236	$834	$660	$222	$318	$333	$137		$310
Meals	$688	$540	$381	$168	$198	$224	$142		$213
Transportation	$50	$50	$50	$50	$50	$50	$250	$100	$400
Registration	$276	$3,000	$3,300	$3,850	$3,000	$2,500			
					Total	$[illegible]28,028		Total	$[illegible]1,752

Highlighted cells are estimates; registration rate was not available on their website.

Table D.3: Communications Development Budget [38], [39]

One-time cost

	Consultant Svcs (designer, videographer, etc.)	Production
Website Dev	$[illegible]5,000	
Webinar/DVD Dev	$[illegible]1,500	$[illegible]1,700
Print Media	$[illegible]2,500	$[illegible]3,000

Total	$[illegible]3,700

Table D.4: Total Communications Budget

	Total Communications Budget				
	Year 1	Year 2	Year 3	Year 4	Total
Travel	$[illegible]29,780	$[illegible]32,758	$[illegible]36,034	$[illegible]39,637	$[illegible]138,209
Communications	$[illegible]13,700				$[illegible]13,700
Total	$[illegible]43,480	$[illegible]32,758	$[illegible]36,034	$[illegible]39,637	$[illegible]151,909

Added 10% each year to account for inflation, rise of oil prices, etc.

Appendix E: ROI Calculations

$24,000 NBR – base price, no technical service elements for customers.

$140 billing per treatment (per Medicare billing table)

75% usage per year = 1,530 treatments = $214,200 income/yr.

Assuming a clinic operates 2,040 hours per year and 75% of the time the NBR is in operation.

Manpower costs = $86.25/ treatment x 1,530 treatment = $131,962.50 cost/yr.

Based upon $65/hr therapist or nurse @ 45 minutes (0.75 hr) per treatment = $48.75/treatment.

Plus $150/hr doctor evaluating video results @ 15 min (0.25 hr) per treatment = $37.50/treatment.

$86.25 x 1,530 treatments/yr = $131,962.50

Profit = $214,200 - $131,962.50 = $82,237.50

ROI = $24,000/$82,237.50 = 0.29 yrs or 3.5 months

Therefore, a clinic or a hospital operating the NBR 75% of the available time will see a simple payback in 3.5 months. Assuming that the same amount of time is needed for a competitor device costing $120,000 the payoff will be 1.46 years or 17.5 months, significantly longer than the NBR.

Appendix F: Market Research Log

Nystagmus-Based Repositioning (NBR) Device

Market Research Log

ETM 555/655: Technology Marketing - Winter 2013

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Justin Thompson
Phaneendra Rampalli
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Table of contents

Introduction

This marketing log shows the steps we have taken in the marketing process of NBR. This marketing log is developed based on the notes taken in our weekly team meetings and also based on the instructor's feedback on our midterm and final presentations. This report contains how we came up with the product and how we divided the tasks and research done in the industry to get the facts out. We started our research by exploring the market segments and looking into the results of our brainstorming. We developed the communication strategy, pricing strategy, and other marketing tactics by using the textbooks and other market research literature. We conducted a survey using SurveyMonkey, a free online tool, which helped us find out which factors are most important to potential buyers and what price they would pay for this device. We have also included key learning points for each step of our process.

Idea Generation

We started our exploration by laying out each of the team member's ideas for a project. We had a face-to-face team discussion that helped us brainstorm ideas; which are listed below.

1. Vertigo Machine
2. New Battery
3. HDTV
4. New Intel Voice recognition chip.

The team voted on an initial project idea, which was initiated by one of the team members; however, the majority of the team was not familiar with the product or its function, but a video demonstration addressed this concern. We have chosen "NBR" because it is an upcoming high-tech device that has not entered the market.
Key learning: In this phase of brainstorming, we learned to respect each other's ideas. The main challenge was agreeing on the idea because most team members were not familiar with the device or the condition it treated.

The Device

Getting to know the product in detail helped us understand how to design our marketing plan. Vesticon is well-known company in the medical field and has developed quality products integrated with Epley maneuvers for treating vertigo patients. Vesticon has a well-establish reputation for the quality, accuracy, performance, and reliability of its products and treatments. According one of the team members who helped design the Epley Omniax chair, NBR is the second generation of that device. Compared to its predecessor, NBR has been reduced in size significantly. The device includes goggles for eye-motion tracking, a headband for canalith positioning, and a compatible laptop and software.

Key learning: NBR is currently ready to be launched to the market, but it requires extensive market forces in order to push the product into the market successfully. After

conducting a detailed product analysis, we were able to find out what the actual decision-making processes are.

Analysis of Competitors

To begin our competitive analysis, we determined the features of the product together with the competitor's products. Our competitors are not only the diagnostic devices, but also manual maneuvers, exercises, and self-treating kits. We utilized all available resources and information to find the products in common and also took manual maneuvers and treatments into our considerations. The benchmarking features are listed below (see Appendix 1):

- Goggle
- Video Storage
- Video Playback
- Report Editor
- Sound Recording
- Eye Motion Tracking
- Head Tracking Ability
- Switch One Camera/Two Cameras
- SW Controlled Light
- Elapsed Test Time
- Switch-Operated Video Capture
- Switch-Operated Light Adjustment

Key learning: During the process of gathering data, the hardest part is to place the right features and specifications that most devices have. In order to come up with the key features, we decided to focus on just the important feature that this kind of diagnostic devices should have.

Market Segmentation

Since NBR is classified as a medical device in treating patients suffering from BPPV, our team identified hospitals and clinics to be our potential customers. The team also assumed that there might still be other potential customers who may want to setup private clinics or facilities to diagnose and treat vertigo patients. The team assumed that this market segment would include independent health care professionals such as physical therapists, neurotologists, audiologists, chiropractors, and otolaryngologists.

The next step for the team was to do research and find out how many registered hospitals and clinics are in the U.S. The team also had to find out how many registered physical therapists, neurotologists, audiologists, chiropractors, and otolaryngologists are in the U.S. To accomplish this, our team had to study the labor statistics and hospital data to conclude who our potential NBR customers would be. Our team also sent out survey questions to potential customers in the medical field asking their feedback on the NBR device. From this research we were successfully able to identify a substantial percentage of customers that would consider purchasing the NBR device.

Market Analysis

As we mentioned in the prior section that NBR's potential customers are hospitals, clinics, and private facilities, we first have to calculate the overall market size of the patients suffering or are likely to suffer from BPPV. From our research we found that one study estimates that as many as 35% of adults aged 40 years or older, approximately 69 million Americans in the United States, have experienced some form

of vestibular dysfunction [1]. Other estimates show that 7.5 million patients with dizziness and possible vertigo are examined each year in ambulatory centers [2]. In another study, the author found that the lifetime prevalence of vertigo in adults ages 18 to 79 is 7.4% with a clear increase in prevalence with age [3]. One report indicated that dizziness and vertigo together accounted for 2.5% of all emergency department visits during a 10-year period [4]. Based on this research data, NBR's market size could potentially be in millions of dollars.

Target Market Identification

Identifying the target market is not an arbitrary process. It entails a thorough analysis and elimination process to reach healthcare providers that best fits our product's (NBR's) segment. Our device is considered medical equipment; hence, we have to assume that our market lies within the healthcare providers. This main target could also include other healthcare providers who would potential want to switch to our product due to its low price and the distinguishing features that it provides compared to other devices available in the market right now. From our research and analysis we can conclusively suggest that our market for NBR is substantial. We estimate that the reasonable amount in dollars would easily be in millions.

Customer Research

Based on the research of NBR and what it offers, we came to a conclusion that NBR has potential customers that may be either interested in purchasing or have an impact on the purchase decision: hospitals and private clinic administrators, insurance companies, patients, and private practitioners. We interviewed a neurotologists, audiologist, and physical therapist who gave us feedback on what customers need. By talking to potential customers we got to know the concerns they had with other vertigo treatment devices and manual maneuvers.

We also researched what entities concerned our customers when buying a device that treats vertigo. The survey helped us in prioritizing the concerns, which helped the team come up with a device that fills the gap created by previous devices. For example, in order to use any new device customers are concerned with the need for software training, which can sometimes feel as challenging as learning a new language. But, NBR comes with the same software package as its predecessor. In the vertigo treating device category, customers wanted something less expensive with the same reliability and integrity of its predecessor.

Key learning: In this stage, our learning was to identify our customer and users of the Epley Omniax. We also realized that customers buy the product not only because it is cost efficient, but they also look at the quality of service offered by our product.

Customer Analysis

In this phase, we sent out the survey to our primary marketing segment in order to identify the needs and the purchase decision process. We did our survey (attached in the marketing plan appendix) and gathered the data to get to know what exactly customers want in the product. We had approximately nine participants in the survey.

After analyzing the survey results we found that customers in our target segment needed the improvement in the quality of the service. For example, the new NBR product will beep to signal when it is time to change the orientation of the patient. Customers also needed a less expensive device in the market. According to the results of the survey, we found that these customers had weights on some of the important attributes like: ease of use 80%, reliability and integrity 100%, affordability 90%, and increased confidence 60%. Below is the graph showing the results.

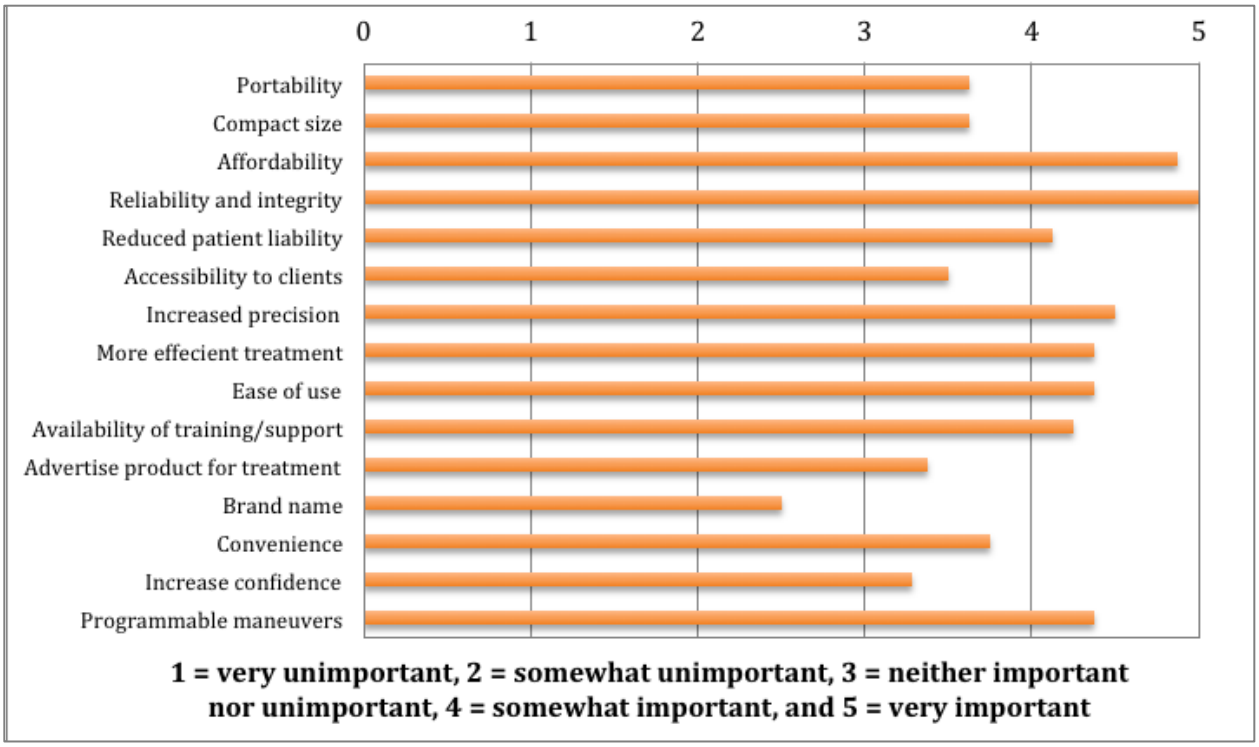

Figure 1: Results of Customer Ratings

These attributes gave us a crystal clear picture of the factors that will affect their decision-making process for purchasing this product; it also helped us understand the customers better. These attributes helped us understand the value drivers for our customers and the different criterion a potential customer will use to make a purchase decision.

Key learning: Customer analysis is a very crucial part to determine the customer needs and the value drivers. The customer survey helps in identifying the right set of questions to be asked. We have asked the customers to rank the product attributes since they are key to identify the customer needs. It really helped us to analyze our product and what our product delivers as well. Data analysis was a crucial step in identifying the needs and getting the value drivers of our customers.

Competitor Analysis

From the gathered data in competitive research, our team decided to determine and focus on the available data about all the potential competitors that would align with

NBR's product functionalities. NBR is the next generation of Epley Omniax and it is compatible with the software and hardware that come with Epley Omniax, which is a good start for NBR to enter to the market. The direct competitors of the products are ENT surgeons who provide surgical treatment of vertigo, FDA, and also Epley Omniax itself. We also found that GyroStim and TRV chair have similar abilities and product features when compared to the Epley Omniax but with a lower cost (shown in Appendix 1).

Communication Plan

In the process of defining the communication strategies, we tried to highlight the effective plan for our product. There are various ways to reach customers' awareness because our product has not been launched to the market yet. Because of this, initially, we would start with face-to-face meetings in order to reach customers individually. Other than face-to-face meetings, we would continue using the related tactics for our communication plan by firstly defining our target group for this plan, such as neurologists, audiologists, physical therapists, chiropractors, otolaryngologists and their respective assistants; hospital/clinic administrators (including VA hospitals); health insurance companies; medical device distributors; investors; VA clinics; and also registered private and public hospitals.

Once we have the target audience, the face-to-face tactics would include office visits with important customers and exhibiting at medical conferences and expos across the United States and overseas. Webinars and DVD demos are included in the plan, which will be posted on the product website (and potential partner websites), demonstrating the benefits of and how to use the NBR device. Website, social media, and medical blogs are the way to reach customers using fewer resources while providing 24/7 access. Communication Tactic-Audience Matrix is a matrix showing the methods of communication we will use for each of the targeted audiences, portrayed in Appendix 2.

Financial Analysis

The financial analysis was developed by our team to represent the costs over the first four years of operation including: R&D, patents, FDA, lawyers, and software development to name a few. These were based on estimates of the costs of those items and are intended to provide readers of the marketing plan with a cost basis for the device. Including training with the device package puts the cost at approximately $6,000. Selling the device at that level is much too low and would not allow for effective market capitalization.

We ultimately chose to peg the price to the Epley Omniax chair, which retails for $120,000; the NBR will cost 20% or $24,000. Escalating the cost of the NBR to this level allows it be to be reduced as other market entrants are found and keeps us in a good market position. With patents and FDA approval under our belt, it should stave off other competitors.

Our survey did not reveal the insight to pricing we had hoped it would. Practitioners were not aware of a valid price because they are may be an influencer rather than a

purchaser, or they simply do not concern themselves with the cost of other vertigo treatment devices on the market. It is difficult to say what the reason was for this.

Key learning and suggestions:

- *Provide a revised survey to hospital administrators, insurance companies, practitioners, and patients.*
- *Interview a medical device specialist who knows more about new device introduction to the market.*

Working Progress and Meeting Minutes

The following table shows the progress of the teamwork done over the course of the term.

Table 1: Meeting Minutes

Meeting Date	Topics Discussed	Tools/Methods	Problems	Assess Process/Outcome
1-9-13	Set up Google+ Hangout for remote meeting access	Troubleshooting on laptops/iPhones	For the majority of the team, this was their first time using the software, took several tries to get us all on the same page	
1-9-13	Project selection	Team discussion brainstorming ideas	Majority of team members were not familiar with the technology, but Ashish was able to show a video that answered team member's questions	Team was able to negotiate and agree on project idea
1-11-13	Finalize project proposal	Team discussion brainstorming additional project ideas		Prioritized project ideas 1) Vertigo machine, 2) New battery, 3) HDTV, 4) New Intel voice recog chip
1-11-13	Scheduling regular meetings	Team discussion		Decided on Google+ Hangout, and will schedule face-to-face when needed
1-18-13	Assigning marketing plan tasks	Negotiate assignments		Assigned first six sections of marketing plan outline
1-25-13	Review survey questions and group check-in	Team discussion and brainstorming, round table report out	3 of 6 team members attended by Google Hangout, sound quality wasn't as good with some members	Finalized draft, assigned for next week

Meeting Date	Topics Discussed	Tools/Methods	Problems	Assess Process/Outcome
1-28-13	Interview doctor for survey revisions	Scheduled 1 hour phone interview		Came up with more data to revise survey questionnaire, will schedule a meeting with other practioners, and will meet with this doctor again when survey is finalized in case we have further questions
1-31-13	- Follow up on the assigned section on the term report. - Prepare slides for the next class presentation - Finalize the survey question for Professor Weber's approval	Email/phone for the notification for the coming up deadline		-Have 30% of the report written -Survey questions are ready to be approve by Tuesday 5th
2-4-13	Fannie interviewed physical therapist who also suffers from vertigo	Phone/Face Time interview	Was not able to send her video of NBR device being tested	Received feedback about device design: would like the ability to modify angles for people with nech injuries, ability to use device while allowing patient to bend at waist
2-5-13	Preliminary marketing plan presentation	PowerPoint presentation to class	Sound was not activated which affected videos being presented	Received feedback from the professor/class for more information/data to be included in the marketing plan
2-8-13	Marketing plan brainstorm and assignments and update on work completed so far	Face-to-face meeting		Draft outline of marketing plan with assignments, survey questionnaire finalization
2-15-13	Team did not meet to focus on midterm			
2-22-13	Marketing plan task updates (pricing strategy, CVD,	Face to face meeting		Each team member gave an update on assignments and received feedback on their sections

Meeting Date	Topics Discussed	Tools/Methods	Problems	Assess Process/Outcome
3-1-13	Final presentation consolidation	Face to face meeting		We combined our slides, and each team member provided feedback on other's slides and answered any questions for the presenters
3-8-13	Final report consolidation	Face to face meeting		We reviewed each other's assigned sections and provided feedback

Conclusion

What worked for our team?

- Our team worked cohesively to accomplish the goals and targets to create a comprehensive marketing plan for a unique medical device that is not on the market. This device though new, would be able to capture a significant portion of the vertigo treatment population. That is what made working on this device exciting.

- We followed the syllabus to direct our milestones, leaving us feeling crunched for time when deliverables were due. That often created tension and late nights of project work by teammates.

Limitations

Finding out that there are really four different markets to be aware of for the marketing plan was a difficult pill to swallow. We thought throughout the project that we were just looking at practitioners. We had gone around the margins to identify value drivers that others would be drawn to, such as: ROI for a hospital administrator; seeing and treating more vertigo patients, reducing absenteeism, and improving quality of life for insurance companies and making this treatment much more accessible for patients. It was not a major issue but did require reconfiguration of the plan. Another limitation was the survey results, which should have been more focused; they did not fully illuminate the desire for people to own this device. Another drawback to this marketing plan is the quality of data on the number of practitioners in the United States; we relied upon four- and seven-year-old data because access to current demographics of the physical therapists and neurotologists was held by organizations charging for this information. Not wholly discounting the numbers we have for the available market, it does shadow it somewhat.

References

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Appendix 1

Table 2: Benchmarking Features

Features	**NBR***	Epley Omniax	VF405	TRV Chair	GyroStim	Neuro Kinetic
Purchase Price	$24,000	$120,000	$22,000	$40,000-$50,000	$40,000-$50,000	$150,000
Goggle	Yes	Yes	Yes	Yes	Yes	Yes
Video Storage	Yes	Yes	Yes	Yes	Yes	Yes
Video Playback	Yes	Yes	Yes	Yes	Yes	Yes
Report Editor	Yes	Yes	Yes	Yes	Yes	Yes
Sound Recording	Yes	Yes	Yes	Yes	Yes	Yes
Eye Motion Tracking	Yes	Yes	Yes	Yes	Yes	Yes
Head Tracking Ability	Yes	Yes	No	Yes	Yes	Yes
Switch One Camera/ Two Cameras	Yes	Yes	Yes	Yes	Yes	Yes
SW Controlled Light	Yes	No	Yes	Yes	Yes	No
Elapsed Test Time	Yes	Yes	Yes	Yes	Yes	Yes
Switch Operated Video Capture	Yes	Yes	Yes	Yes	Yes	Yes
Switch Operated Light Adjustment	Yes	Yes	Yes	Yes	Yes	Yes

Appendix 2

Table 3: Communication Tactic-Audience Matrix

	Office Visits	Expos/ Conferences	Email	Phone	Website	Webinars	DVD Demo	Blogs	Social Media	News/ Radio	Print
Hospital Administrators	X	X	X	X	X	X	X	X		X	X
Investors	X	X	X	X	X		X	X	X	X	X
Medical Professionals	X	X	X	X	X	X	X	X		X	X
Clinics	X	X	X	X	X	X	X	X	X	X	X
VA Medical Centers	X	X		X		X	X	X		X	X
Retirement/ Assisted Living Homes	X			X	X		X			X	X
Health Insurance Companies		X	X	X			X			X	X
Medical Device Distributors	X	X	X	X	X		X	X		X	X
General Public					X				X	X	