2016 North American Diabetic Retinopathy Screening Customer Value Leadership Award
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Background and Company Performance

Industry Challenges

According to the American Diabetes Association, an estimated 29.1 million Americans suffered from diabetes in 2012, nearly all of which are expected to have some degree of diabetic retinopathy (DR) within 15 to 20 years. DR is a diabetic condition that causes damage to the blood vessels that nourish the retina, leading to swelling of the retinal tissue. People with DR experience clouded or blurred vision and have difficulty seeing at night; if left untreated DR can cause complete blindness. While there is no cure for DR, patients can avoid blindness with drug, laser, and/or surgical treatment depending on the disease’s progression. The American Academy of Ophthalmology recommends that people with diabetes have a retinal exam at least yearly\(^1\), since early detection and treatment of DR can reduce the risk of severe vision loss by 90 percent.

Despite this recommendation, a study conducted by American Medical Association finds that less than 50% of people with diabetes undergo annual screening for retinopathy in the US. Factors which influence screening compliance include lack of insurance and healthcare access, knowledge of diabetes-specific ocular risk, and health literacy, cultural, and language barriers\(^2\). Consequently, diabetic retinopathy is the leading cause of blindness among working-age adults\(^3\).

Ophthalmologists traditionally conduct retinal exams, but incentives to increase patient compliance with annual diabetic retinal exams (DREs) has led some primary care physicians to purchase desktop fundus camera systems to conduct DREs in conjunction with the patient’s regular checkup. Primary care physicians send fundus images off-site for analysis by ophthalmologists or ophthalmic technicians who read and recommend if the patient should be referred to an ophthalmologist for further examination and treatment. While this is a step towards achieving 100% DRE compliance, and eradicating a leading cause of preventable blindness, desktop fundus imaging systems are expensive, making them available to only about the top 10% of primary care practices by volume.

Frost & Sullivan firmly believes that new technologies in primary care settings that reduce the cost of screening, enhance ease-of-use, and improve patient comfort, will incite higher DRE compliance and reduce vision damage resulting from DR that is detected too late.

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Customer Impact and Business Impact of Welch Allyn, Inc.

Founded in 1915 and headquartered in Skaneateles Falls, New York, Welch Allyn, Inc. is a leading global manufacturer of medical diagnostic equipment that is a division of Hill-Rom (NYSE: HRC). With nearly 2,500 employees working in 26 different countries, Welch Allyn focuses on the customer and imagines how healthcare will be delivered in the future to develop tools and future-proof technologies. Customers include physicians’ practices, community clinics, skilled nursing facilities and emergency departments—where 95 percent of patients first seek medical treatment.

To make annual diabetic retinal exams more accessible and convenient for primary care physicians and patients living with diabetes, Welch Allyn obtained rights to RetinaVue™ software applications (formerly TRIAD Network) and a management relationship with RetinaVue™ P.C. (formerly Hubble Telemedical Tennessee P.C.) from its acquisition of Hubble Telemedical in January 2015. Furthermore, Welch Allyn developed the RetinaVue™ 100 Imager, the world’s most advanced handheld fundus camera, that reduces the cost of retinal imaging technology by up to 75% compared to traditional desktop fundus cameras.

The Welch Allyn RetinaVue Network is a complete turnkey solution for primary healthcare providers that includes HIPAA-compliant RetinaVue Network Software, the RetinaVue 100 Imager, and a remote team of board-certified retina specialists at RetinaVue P.C.

The Highly Secure and User-Friendly RetinaVue Network Software

RetinaVue software applications are HIPPA-compliant and utilize military grade encryption to ensure the security of all patient data. The RetinaVue software applications are vendor-neutral, enabling their use with any fundus camera.

Retinal images taken in a primary care office are given an image-quality score from 0 to 100 and color-coded (red, yellow, and green) to help clinicians determine if the image is viable for clinical assessment by the retina specialists. Images scored between 100 and 41 are color-coded green and have a 99.5% confidence rating that the image is readable. Yellow-coded images with a score between 40 and 21 still have a confidence rate over 90%. Images color-coded as red should be retaken, but if clinicians cannot get a better image, they can still send the images to specialists as they can sometimes be read. By color-coding the images, healthcare providers assess whether the image is viable for assessment before patients leave the office, reducing the need for additional appointments to retake images.

After acquiring the fundus images, clinicians transfer them over secure RetinaVue Network software via a connected computer, which automatically syncs with the fundus camera—clinicians select which images to submit to the retina specialist with one click. A complete diagnostic report and referral/screening plan are returned to the healthcare provider via the clinic’s online portal the same day, many times within 90 minutes.
Every RetinaVue software subscription includes convenient free access to new and historical retinal reports via the online clinic portal that permits users to receive, store and manage retinal reports as well as review statistics on exam volume, diagnoses and image quality. An industry-standard HL7 interface is available for integration into commercial electronic medical record platforms. Of course Welch Allyn technical support is included, and the ability to consult with RetinaVue P.C. retina specialists is available.

Welch Allyn maintains an ongoing commitment to meeting the evolving needs of healthcare providers by releasing customer-driven system upgrades about every six months to ensure optimum usability.

**The RetinaVue 100 Imager**

The RetinaVue 100 Imager is a highly advanced handheld non-mydriatic fundus camera that is easy to use and provides images of the same quality as traditional desktop fundus cameras that cost three times more.

Any member of the healthcare staff in a primary care practice can capture high-quality images after a brief training provided at no charge by Welch Allyn—just align the distal end of the camera with the patient’s eye and the imager automatically focuses, adjusts the illumination, and snaps a picture. A 45-degree view of the retina is displayed on RetinaVue’s touchscreen LCD, together with the image-quality score, providing clinicians with enough information to confidently submit the image for evaluation, or retake the image if necessary.

The RetinaVue 100 Imager costs 75% less than traditional desktop fundus cameras, making diabetic retinal exam technology affordable for the majority of primary care practices for the first time. The RetinaVue 100 Imager has a suggested selling price of $4,995.

RetinaVue 100 Imager is designed to work exclusively with RetinaVue Network Software. Viewing and transferring the images acquired by the RetinaVue 100 Imager requires a software license and contract for diagnostic interpretation services with RetinaVue P.C.

**RetinaVue P.C. Diagnostic Services and Referral/Screening Plan**

Encrypted fundus images taken in primary care settings are sent to RetinaVue P.C. via secure HIPAA-compliant RetinaVue software to be evaluated exclusively by fellowship trained, board certified retina specialists. The specialists at RetinaVue P.C. perform expert
interpretation and return a diagnostic report and referral/screening plan to the primary care office the same day—usually in 90 minutes. For health systems that have ophthalmologists on staff, RetinaVue can be configured to allow staff ophthalmologists to create the diagnosis and referral/screening plan.

RetinaVue P.C. is the only retinal screening provider comprised entirely of fellowship trained, board certified retina specialists. Competitor’s clinical specialist teams often include ophthalmic technicians, who are frequently trained to identify retinal problems specific only to diabetic retinopathy. RetinaVue P.C.’s advanced retina specialist network analyzes images for many retinal issues, enabling primary-care physicians to provide an all-encompassing diagnosis to patients. “In addition to identifying, classifying and documenting all levels of diabetic retinopathy from very mild to vision threatening, retina specialists sometimes find indications for other systemic diseases — including papilledema, hypertension, macular degeneration (AMD), and cancer,” said Edward Chaum, M.D., PH.D., Chief Medical Officer, RetinaVue P.C.

Welch Allyn designed the RetinaVue diagnostic report with primary healthcare providers in mind and, as a result, have received abundant positive feedback on its design and usability. Patient data appears at the top of the RetinaVue report, followed by fundus images, clinical diagnosis, corresponding ICD diagnosis codes, and a patient referral/screening plan. Healthcare providers can easily share fundus images and diagnostic results with patients—fostering better patient education, satisfaction, and compliance with treatment plans. The interpreting retina specialist’s credentials, signature, and contact information is included so clinicians can easily contact the specialist with any questions. Finally, the bottom of the RetinaVue report includes electronic audit trail information required for HIPPA compliance.

**Welch Allyn’s Commitment to Industry-Leading Turnaround Times**

To ensure timely return of RetinaVue diagnostic reports, Welch Allyn sends notification alarms through email, text message, or phone to RetinaVue P.C. retina specialists when images are available for interpretation. The busy retina specialists find natural ways to integrate image interpretation into their daily workflow and can turn notifications off when necessary. Welch Allyn maintains metrics on turnaround time, enabling the company to expand the specialist network as needed to ensure reports are returned promptly. Retina
specialists in this network contract exclusively with RetinaVue P.C. to ensure they do not become overwhelmed by multiple screening services. Frost & Sullivan recognizes the need for quick turnaround times and believes that Welch Allyn’s commitment to industry-leading service levels enables clinicians to provide an unmatched level of care.

Primary care practices pay $25.00 per report for expert interpretation services and software license; there are no monthly minimum charges, as is the case with other screening services, ensuring that clinics only pay for what they use. Additionally, clinics are not charged for images deemed unreadable. Welch Allyn maintains an operations team that constantly monitors incoming exam volume, network usage, turnaround times, and image quality to maintain high service levels and ensure any problems are addressed immediately.

**High Focus on Customer Satisfaction and Support**

Welch Allyn maintains a large team of highly-trained sales specialists and strong relationships with the all the leading medical product distribution companies throughout the United States to properly service and support RetinaVue customers. Although customers can choose to either purchase or lease-to-own equipment, due to its low-cost, most customers choose to purchase the equipment.

With a RetinaVue software subscription, customers go online and create a clinic portal that enables them to send images, receive and manage diagnostic reports, and review image quality metrics. Welch Allyn representatives will setup and train users on the RetinaVue Network software and fundus cameras, which usually takes less than one hour. However, the representative typically remains onsite longer to ensure the customer is fully trained, including helping the staff take and submit practice images.

At minimum, all Welch Allyn supplied fundus cameras come with a one-year warranty, and customers can choose to become members of the Welch Allyn Partners in Care™ program for extended product warranty and covered repairs for damage caused by dropping the RetinaVue Imager. Furthermore, Welch Allyn has an exchange program for devices that need to be returned for service—Welch Allyn will send a refurbished device to the customer for use while their device is being serviced, so downtime is minimized.

Frost & Sullivan identifies Welch Allyn as a leader in providing customer value, both in terms of extremely cost-effective solutions that enable improved patient compliance with annual diabetic retinal exams, as well as providing advanced levels of customer service and support.

Welch Allyn has a 100-year track record of exceeding customer expectations, and rigorously monitors and responds to customer input for all of its products. Moreover, the company strives to intimately understand both the large and small challenges faced by healthcare providers and develop simple and affordable solutions, sometimes even before they recognize the problem.
**Conclusion**

Despite the American Academy of Ophthalmology’s recommendation of annual retinal exams for people with diabetes, the American Medical Association finds that less than half the people living with diabetes undergoes annual screening for retinopathy in the United States. Factors which influence screening compliance include lack of insurance and healthcare access, knowledge of diabetes-specific ocular risk, and health literacy, cultural, and language barriers. Enabling access to diabetic retinal exams during visits to primary care physicians can increase compliance to 90% or more.

Welch Allyn’s RetinaVue Network, including the RetinaVue 100 Imager, reduces the cost of traditional desktop fundus retinal cameras by up to 75%, enabling more primary care practices to have access to retinal screening technology and have more control over management of their patients with diabetes.

The company’s commitment to providing the highest quality service led RetinaVue P.C. to contract exclusively with fellowship-trained, board-certified retina specialists. Also, Welch Allyn tracks and analyzes customer feedback, report turnaround times, and image quality metrics to ensure that healthcare providers receive consistently high service. Diagnostic reports are guaranteed to be returned the same day—often in 90 minutes.

With its breakthrough camera technology, high-quality, HIPPA compliant network enabling industry-leading turnaround times, Welch Allyn, Inc. earns Frost & Sullivan’s 2016 North America Customer Value Leadership Award in the diabetic retinopathy screening market.

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Significance of Customer Value Leadership

Ultimately, growth in any organization depends upon customers purchasing from your company, and then making the decision to return time and again. Delighting customers is therefore the cornerstone of any successful growth strategy. To achieve these dual goals (growth and customer delight), an organization must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.

Understanding Customer Value Leadership

Customer Value Leadership is defined and measured by two macro-level categories: customer impact and business impact. These two sides work together to make customers feel valued, and confident in their products’ quality and long shelf life. This dual satisfaction translates into repeat purchases and a high lifetime customer value.
Key Benchmarking Criteria
For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Customer Impact and Business Impact—according to the criteria identified below.

Customer Impact
  Criterion 1: Price/Performance Value
  Criterion 2: Customer Purchase Experience
  Criterion 3: Customer Ownership Experience
  Criterion 4: Customer Service Experience
  Criterion 5: Brand Equity

Business Impact
  Criterion 1: Financial Performance
  Criterion 2: Customer Acquisition
  Criterion 3: Operational Efficiency
  Criterion 4: Growth Potential
  Criterion 5: Human Capital

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology
Frost & Sullivan’s 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry players and for identifying those performing at best-in-class levels.
# Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan Awards follow a 10-step process to evaluate award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

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<tr>
<th><strong>STEP</strong></th>
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<th><strong>KEY ACTIVITIES</strong></th>
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| **1 Monitor, target, and screen** | Identify award recipient candidates from around the globe | • Conduct in-depth industry research  
• Identify emerging sectors  
• Scan multiple geographies | Pipeline of candidates who potentially meet all best-practice criteria |
| **2 Perform 360-degree research** | Perform comprehensive, 360-degree research on all candidates in the pipeline | • Interview thought leaders and industry practitioners  
• Assess candidates’ fit with best-practice criteria  
• Rank all candidates | Matrix positioning all candidates’ performance relative to one another |
| **3 Invite thought leadership in best practices** | Perform in-depth examination of all candidates | • Confirm best-practice criteria  
• Examine eligibility of all candidates  
• Identify any information gaps | Detailed profiles of all ranked candidates |
| **4 Initiate research director review** | Conduct an unbiased evaluation of all candidate profiles | • Brainstorm ranking options  
• Invite multiple perspectives on candidates’ performance  
• Update candidate profiles | Final prioritization of all eligible candidates and companion best-practice positioning paper |
| **5 Assemble panel of industry experts** | Present findings to an expert panel of industry thought leaders | • Share findings  
• Strengthen cases for candidate eligibility  
• Prioritize candidates | Refined list of prioritized award candidates |
| **6 Conduct global industry review** | Build consensus on award candidates’ eligibility | • Hold global team meeting to review all candidates  
• Pressure-test fit with criteria  
• Confirm inclusion of all eligible candidates | Final list of eligible award candidates, representing success stories worldwide |
| **7 Perform quality check** | Develop official award consideration materials | • Perform final performance benchmarking activities  
• Write nominations  
• Perform quality review | High-quality, accurate, and creative presentation of nominees’ successes |
| **8 Reconnect with panel of industry experts** | Finalize the selection of the best-practice award recipient | • Review analysis with panel  
• Build consensus  
• Select winner | Decision on which company performs best against all best-practice criteria |
| **9 Communicate recognition** | Inform award recipient of award recognition | • Present award to the CEO  
• Inspire the organization for continued success  
• Celebrate the recipient’s performance | Announcement of award and plan for how recipient can use the award to enhance the brand |
| **10 Take strategic action** | Once licensed, company may share award news with stakeholders and customers | • Coordinate media outreach  
• Design a marketing plan  
• Assess award’s role in future strategic planning | Widespread awareness of recipient’s award status among investors, media personnel, and employees |
About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best in class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.