

GLOBAL HEALTH

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Photo: D-Rev

The first baby treated by D-Rev's Brilliance device in Ogbomoso, Nigeria

BRILLIANCE II: Achieving Impact Through Licensing

D-REV, STANFORD, CALIFORNIA

ESTABLISHED 2007

KRISTA DONALDSON, CEO

THE PROBLEM/SOLUTION SPACE

Globally, 60 percent of all newborns experience infant jaundice each year.¹ Jaundice manifests as a yellowish appearance to the skin and sclerae (the whites of the eyes) caused by hyperbilirubinemia, or excess levels of the chemical bilirubin in the bloodstream. Bilirubin accumulates if a baby's liver cannot remove it from the blood fast enough due to immature liver function or other underlying conditions.

In most infants, jaundice resolves naturally; but for approximately 12 percent of babies, the condition requires treatment.² In the U.S. and other first world nations, infant jaundice is routinely treated with phototherapy—shining blue light of a specific wavelength

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and intensity on the baby's skin for two to three days. The blue light causes chemical reactions within the bilirubin molecules that enable the body to excrete bilirubin harmlessly into the urine and stool.

Without medical intervention, however, jaundice can result in learning disabilities, brain damage, deafness, and even death. Every year in Africa and Asia, more than 6 million newborns with jaundice do not receive the simple treatment they need due to the lack of effective phototherapy solutions in these low-resource settings.³ Newborn jaundice and complications caused by the condition account for an estimated 6-10 percent of neonatal mortality worldwide.⁴



Image: D-Rev

An early CAD rendering of the Brilliance neonatal phototherapy device

ABOUT BRILLIANCE

To help address the problem of infant jaundice in low-resource settings, the team at D-Rev—a U.S. nonprofit technology company with the mission to improve the health and incomes of people living on less than \$4 per day⁵—developed Brilliance. Brilliance is a neonatal phototherapy device based on LED lighting technology. Brilliance LEDs consume half the power used by compact fluorescent bulbs (“CFLs”—the current standard in phototherapy units) and last 16 to 25 times longer. To meet the unique needs of Brilliance’s target customers—physicians at district-level or larger hospitals working in neonatal intensive care units (NICUs)—the device is height-adjustable and can be seamlessly integrated with other hospital equipment to allow doctors to care for babies suffering from multiple conditions. It also meets American Academy of Pediatrics recommendations and UNICEF phototherapy specifications and has been shown in benchtop tests at Stanford to perform as well as (or better than) the most expensive equipment used in Western NICUs. Importantly, D-Rev hoped to offer Brilliance to low-resource customers for roughly \$400—a fraction of the \$3,000 price tag for state-of-the-art phototherapy equipment and significantly less expensive than the mid-range products widely used throughout countries like India.

ONE CHALLENGE: ACHIEVING IMPACT THROUGH LICENSING

In preparing to take Brilliance to market, D-Rev started by evaluating its own competencies. “We’re very conscious of what we can do and what we can’t do,” said Krista Donaldson, D-Rev’s CEO.⁶ The team concluded that the organization’s strengths were not in product manufacturing or after-sales services, and that D-Rev did not have the vast expertise and connections needed to establish a sales and distribution network in India, which was its preliminary target market for Brilliance. “We knew we needed to license in this case,” noted Donaldson.

The right partner could significantly accelerate Brilliance’s market penetration. However, the team was concerned about finding a collaborator whose mission and goals would align with D-Rev’s focus on impact. D-Rev fully intended for Brilliance to be profitable for its partner, but the team wanted to optimize the sales and distribution model to achieve maximum social impact. They needed a partner who recognized that the medical device market was moving toward greater affordability and was motivated to have increased market reach, particularly into lower income areas. D-Rev recognized that it would have to choose its partner carefully and be creative in how it structured the deal to achieve these desired outcomes.

THE SOLUTION: ALIGNING INCENTIVES IN THE LICENSING DEAL

D-Rev initiated its partner search by speaking with healthcare providers about their preferred neonatal equipment brands and vendors. “We asked doctors and different medical staff which devices they liked and which ones they wished were better,” Donaldson recalled. A small group of companies emerged as leaders, and D-Rev launched in-depth due diligence on these organizations.

With Brilliance’s first engineer, Ben Cline, Donaldson screened potential partners against a defined set of criteria. Among other factors, they looked at each company’s manufacturing facilities and production processes to ensure that they could uphold the product’s high quality standards. They also evaluated each potential partner’s ability to service the products once they were in the market. The strength of a company’s sales and distribution network was also considered, along with its plans for expanding its reach. Additionally, they assessed company reputation.

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“Through our due diligence, Phoenix repeatedly appeared at the top of our list of potential partners,” Donaldson reported. Phoenix Medical Systems is an Indian for-profit company with a well-established presence in the infant and maternal care field. One reason that D-Rev was drawn to the company was that its founder and managing director, V. Sashi Kumar,

had a strong belief that low-resource environments should have access to world-class medical solutions at prices they could afford.⁷

For its part, Phoenix was attracted to the Brilliance device for a number of reasons. Fundamentally, Brilliance was a versatile and affordable product that looked and performed like high-end devices, but was less expensive to operate and required less maintenance. Technically, added Chakravarthy, “They were really excited about the product, both in terms of its light intensity and its uniformity.” Phoenix already had phototherapy devices in its portfolio, but they were based primarily on CFL technology. In fact, the company had a 70 percent market share in India’s CFL phototherapy device market.⁸ However, Kumar was something of a visionary and had already begun thinking about a product that would use an LED light source. “He could see where the medical device industry was going,” commented Jayanth Chakravarthy, the product manager for Brilliance. “We also didn’t walk into his office with only a prototype. We had a well-developed product.” Partnering with D-Rev would allow Phoenix to more

rapidly incorporate an LED-based phototherapy unit into its product offerings. Moreover, Kumar was intrigued by D-Rev's commitment to making the technology so affordable and saw this as an interesting challenge.

With both organizations interested in working together, the next step was to define the details of a partnership agreement. "Negotiations related to any kind of deal like this consume a huge amount of time and resources, especially for a small team," said Donaldson. But, she emphasized, they are critically important. At the core of the agreement, Phoenix would license the technology from D-Rev in exchange for licensing fees and royalties. The agreement permitted Phoenix to manufacture, distribute, and sell Brilliance exclusively throughout India and non-exclusively in much of the rest of the world. It was relatively unusual for a U.S. nonprofit to receive this kind of revenue from an

Indian for-profit, so Donaldson was hopeful that it would help set "a precedent for utilizing cross-sector partnerships and market-driven approaches to address critical global health needs and generate sustainable impact."⁹

In terms of pricing, Phoenix agreed to cap the selling price of Brilliance at approximately \$400 (the price varied somewhat based on exchange rates) to ensure its affordability among D-Rev's target customers.¹⁰ Specifically to help motivate the Phoenix sales team to devote their time and energy to selling to public and district hospitals in India, D-Rev got creative with how it structured its royalty stream. Customers across all market segments would be offered

the same price, but D-Rev would take a lower royalty on sales to healthcare providers in public and district hospitals. "If you sell to a public hospital, you get a bigger cut. If you sell to a private hospital that serves higher-income patients, you don't get as much back," clarified Chakravarthy. By making sales to the target market more lucrative to the sales force, D-Rev believed the reps would be more motivated to reach the desired audience. The same arrangement applied to public hospitals in countries categorized by the United Nations Human Development Index as low or medium resource-limited.¹¹

Another key aspect of the agreement was that Phoenix was willing to "put some skin into the game," said Donaldson. "They could have structured a deal with us where they distributed the product for us but didn't take any financial risks. But Phoenix is a true partner. They co-invested with us and they put a lot into product development. This kind of involvement is critical for any product to be successfully delivered into the market."

By carefully orchestrating its licensing arrangement, D-Rev was hopeful that it had aligned its goals as a nonprofit with Phoenix's goals as a socially committed for-profit



Photo: D-Rev

In order to bring its product to market at a price customers could afford, D-Rev entered into a novel licensing agreement with Phoenix Medical Systems

company. Brilliance was scheduled to launch in mid-2012, and together, the two organizations planned to treat 2 million babies in India by 2016. Reflecting on the partnership and its structure, Donaldson summarized, “Our hope is that this will be a device that sells well across the board. But at the end of the day, we really see impact coming from the public and rural hospitals.” ♦

NOTES

- 1 Jaundice, Centers for Disease Control and Prevention, <http://www.cdc.gov/breastfeeding/disease/jaundice.htm> (September 11, 2012).
- 2 “Brilliance: Need,” D-Rev, <http://d-rev.org/projects/brilliance/need.html> (August 8, 2012).
- 3 B.K. Cline, et al., “Global Burden and Unmet Need for Hyperbilirubinemia Treatment,” http://www.d-rev.org/assets/2011_PAS_Global_Unmet_Need_for_Phototherapy.pdf (September 11, 2012).
- 4 “Project Firefly,” Design That Matters, <http://designthatmatters.org/portfolio/projects/firefly/> (June 14, 2012).
- 5 “About Us,” D-Rev, <http://d-rev.org/about.html> (August 8, 2012).
- 6 All quotations are from interviews with Krista Donaldson and Jayanth Chakravarthy of D-Rev unless otherwise cited.
- 7 “Overview,” Phoenix Medical Systems, http://www.phoenixmedicalsyste.ms.com/index.php?option=com_jumi&fileid=4&Itemid=3 (August 6, 2012).
- 8 “Delivering Brilliance to Hospitals Across India—And the World,” D-Rev, <http://www.d-rev.org/projects/brilliance/delivery.html> (August 9, 2012).
- 9 Ibid.
- 10 Ibid.
- 11 Ibid.