Opportunity Analysis

In addition to the medical procedures themselves, extended stays in a hospital may be associated with several negative experiences. Loneliness, disconnection, loss of identity, anxiety, and fear are illustrations of the types of feelings that are resultant from a hospital’s atmosphere. This may be especially acute for children, but may be relevant to any patient undergoing extended stays in a hospital environment. Therefore opportunities exist to develop products which can alleviate the sense of negativity incurred in the course of a hospital stay.

A common piece of medical equipment is the intravenous (I.V.) pole, to which a majority of patients are coupled to. As they are currently used, the typical I.V. pole is a very sterile utilitarian device that is unattractive and unfeeling, yet an essential tool in a hospital which also serves as a constant accompaniment to the typical patient throughout their stay. This omnipresent medical apparatus provides an excellent canvas by which an opportunistic product can be implemented to improve the hospital experience.

The proposed Ivy system is an easily implementable device that can personalize the I.V. pole and re-establish a sense of individuality and identity to the patient (Figure 1). The hospital environment can become less unfamiliar, more personalized, and may lead to improved mental health of the patient.

**Opportunity for Ivy**

- Decorate & Customize I.V. pole
- Patient Individuality
- Functional space for toys, electronics, memorabilia, etc.
Product Summary

The Ivy is a modular system that is clipped simply onto the lower half of an existing I.V. pole. It consists of three base sections (stalks) and three display surfaces (leaves) that plug into the base sections (Figure 3). Each leaf has a different shape to accommodate for different types of toys or other objects a patient may place in them. Therefore the Ivy returns a sense of identity to the patient because they are able to fully customize the product by putting their favorite toys and objects on display. Since it becomes part of the I.V. pole, it follows the child wherever they go, ultimately creating a friendlier atmosphere for them (Figure 2).

The primary components, the stalks and leaves, are molded plastic and a flexible loop piece that holds cards and paper is molded santoprene, all of which can be recycled. The leaves can be reattached in a manner that allows them to hang downward so as to allow the healthcare professional more space as needed, or to store the product when not in use (Figure 4). Ivy is a retrofitted product which can snap onto current standard I.V. poles, requiring no other alteration nor does Ivy become a permanent fixture once attached. The present prototype is a gender neutral green color which should appeal to a broad spectrum of targeted consumers. Pending product feedback, future color options may be available as well as extended the market segment to include adult patients.

Competitor & Market Analysis

While injection molding manufacturing may be costlier than vacuum forming, in general it is not a prohibitively expensive process without technological hurdles. Additionally the raw materials are reasonably inexpensive and many suppliers exist to provide materials. With these relatively low barriers to entry, it is interesting to note that there does not appear to be any organization which currently competes in the marketspace that Ivy is targeting. The vast majority of products designed to attach to an I.V. pole are medical in nature (e.g. oxygen bottle holders) and preliminary research has found only two firms with products that are more fun in nature and allow personalization of an otherwise standard I.V. Pole. However neither of these potential competitors allow for the utility or customization that Ivy offers.
Currently the Ivy product is not protected by a patent filing, therefore a reasonable and valid concern exists in regards to competing firms appropriating Ivy design elements into potentially competing products.

The primary method of distribution would be via business-to-business channels such as medical suppliers, vendors, and hospitals. Secondary business-to-consumer channels to explore would be hospital gift shops and online retailing. The primary product promotion would not be directed to the end-user, or their guardian, but rather to the healthcare providers. This would take place through industry and trade publications, tradeshows, personal stories, and online advertisements. Secondary channel sales could be utilized to address consumer demand in healthcare markets which are not served by dedicated pediatric facilities or otherwise those facilities that do not provide the Ivy product. Further collaboration opportunities may exist with fund raising organizations who would raise funds to purchase Ivy products to be donated to hospitals.

The estimated retail price would be between $30 and $50 per unit. However depending on actual licensing agreements or manufacturing costs, these estimated prices may be amended. Pending licensing agreements, it would be reasonable to implement volume discounts to hospitals as well as a price premium for individual businesses-to-consumer purchasing.

The initial targeted end-user will be children staying in hospitals for an extended amount of time or in a home care situation requiring the use of an I.V. pole. A future target market would be adults undergoing extended hospital treatment, home care, or hospice/palliative care. Children may be more susceptible to unfamiliar environments and more reliant on creating a familiar atmosphere, therefore it is sensible to pursue this segment as the primary market target.
Being that Ivy will be employed in a hospital environment, there exists a potential need for the product to comply with FDA regulations in regards to approved materials and product design. In addition the product materials will have to be compatible with the standard operating procedures used by a hospital for cleaning and sterilaizing products.

Fundamentally Ivy is an optional “want” product and not necessarily an imperative necessity in a medical environment. As such buyers may be able to exert a large degree of control and with the cost of healthcare, which can lead to a reduction in extrenious expenses, demand may be difficult to predict. On the other hand because plastic raw materials are traded as commodities and the typical plastic manufacturer competes on price, the suppliers may not have any significant influence in the supply chain.

Current substitution products exist in the form of ivPolePals¹ and IV Pole Toppers.² Limited research indicates that some I.V. pole personalization may originate from homemade devices.³ In general, though, preliminary resarch has not identified a breadth of substitute or competitive

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¹ http://www.ivpolepals.com/
² http://hospitalfun.com/index.php?main_page=index&cPath=9
³ http://www.squirreltales.com/parents/decorate.html
products in the marketspace, therefore it is reasonable to assume that there may be a high degree of demand for the Ivy product.

**Situation Analysis**

**Customers**
- Children
- Extended hospital stays
- Home care
- Adults (future market segment)
- Extended hospial treatment
- Hospice/palliative care
- Home care

**Competition**
- ivPole Pal
- Decorative I.V. figures
- No additional utility
- Limited/no customization
- Hospital Fun
- I.V. Pole Toppers
- Expensive
- Limited utility & customization

**Collaborators**
- Hospitals
- Direct Sales
- Fundraising events
- Medical suppliers/vendors
- Nonprofit organizations

**Context**
- FDA regulations on approved plastics
- Compatibility with cleaning products
- Sterilization procedures
- Intellectual property requirements

**Company**
- Patent acquisition
- License to existing medical vendors or injection molding companies

**Necessary Refinements & Developments**

The current prototype is a handcrafted out of medium-density fiberboard (MDF) and coated with standard formulated paint. Actual production models will be crafted in plastic by injection molding, therefore the molds for each component will need to be designed and manufactured. Moreover FDA regulations need to be investigated to determine if there are any regulatory protocols that specify the specific types of plastics to be used in a hospital setting. Even though Ivy itself is not considered a medical device, the attachment of this product to an I.V. pole may, by extension, warrant certain product safety features that need to comply with a medical setting. Materials must also be chosen that have a reasonably degree of resistance to corrosive cleaners (e.g. bleach) that may be used to sanitize the product. Finally the design may have to be refined so as to allow the complete cleaning of the product, i.e. no sharp corners which could allow the collection of biological material.
Next Steps

Child Life Specialists with Rainbow Babies & Children’s Hospital (University Hospitals, Cleveland, Ohio) were approached and provided an opportunity to evaluate the Ivy prototype. Their valuable feedback indicated that the product would have great potential and integrate well with the dominant logic of their services, i.e. provide a familiar and friendly environment for child patients. Based on this positive feedback, additional research should be gathered from other hospital organizations so as to corroborate this anecdotal feedback. Additional prototypes may need to be constructed as the maximum market size is determined. The additional steps are as follows:

1. Construct additional prototypes
2. Obtain feedback from other regional children’s hospitals
3. Modify device, as needed, based on feedback
4. Investigate buying practices for pediatric hospitals
   a. Are non-medical purchases done via vendor or is there a budget to allow autonomous discretionary purchases
   b. Initiate contact with suppliers and vendors and investigate future opportunities
5. Determine materials compliance
6. Obtain permission to allow patients to utilize the Ivy product for a short-term time frame
   a. Patient interaction may involve regulatory compliance or other special permission to be investigated
7. Final modification of design based on healthcare professional and patient feedback
8. File provisional patent for final design
9. License product to collaborating firm or approach manufacturing firms as appropriate
10. Investigate product use for adult market segment

Business Model

The intended business model is to acquire a utility patent then license the design to a medical supply company or other firm currently manufacturing injection molded products. Ivy is a unique product without any current competitors; therefore it may stand to reason that a medical supply company would be unwilling to take the risk of manufacturing the device without a clear precedent of a similar product in the marketplace. Therefore it is prudent to consider alternative business models, the primary of which is to collaborate with injection molding firms (either domestic or international) and provide the capital expenditure to create the required molds as well as secure production capacity with the manufacturing firm. By assuming the manufacturing risk, medical vendors may then be inclined to stock the product and incorporate it into their catalog. Additionally it may be sensible to also consider how direct business to business and
business to consumer selling operations should be managed. To that extent advertisement by social media outlets (e.g. Facebook) may create brand awareness among internet consumers. Being that many virtual and offline medical support communities exist, an advertisement campaign focused on these groups may initiate a grassroots advertisement campaign for Ivy.

Some healthcare organizations may be experiencing financial burdens which would reduce the probability of them purchasing Ivy products. As a result, it would be sensible to collaborate with fundraising organizations that would raise the funds necessary to purchase the Ivy products which would subsequently be donated to the recipient healthcare facility.

The current product will primarily be target toward children however adults would be a secondary market to investigate. With an increase in an aging population (e.g. Baby Boomers) there is potential for a market segment that would appreciate the customization and utility of the Ivy product. Consequently future development and licensing of an adult Ivy product will be considered.

**Financial Projections**

To mass produce the product, it is estimated that Ivy would require four individual molds at an estimated cost range of $30,000- $50,000. The raw material variable cost is projected to be $5 per unit. Monthly selling, general, and administrations costs would be roughly $50,000 in the early stages (Table 1).

The company may require an initial significant investment, the primary spending of which would be to secure a patent for Ivy. Additional expenditures include performing feasibility studies beyond Rainbow Babies and Children Hospital. This would necessitate traveling to other top children’s hospitals in the country and provide them with prototypes to test the functionality of Ivy as well as any affect on a child's emotional well-being. This would also provide additional marketing data by which production units can be better estimated.

If Ivy is to be manufactured and sold by the company, then the prices will be differentiated based on bulks sales or individual sales. Otherwise the company may license the product and receive royalties on sales from the manufactures and/or distributors.
Figures and Tables

Figure 1 - Ivy Displaying You

![Image 1 of Ivy Displaying You](image1)

![Image 2 of Ivy Displaying You](image2)

![Image 3 of Ivy Displaying You](image3)

Between the three leaves, any object within a given size is able to be held and put on display.

1. plush toys, key chains, action figures, pads of paper
2. mp3 player, hand held electronics, medications, larger toys
3. cards, drawings, flat items

Figure 2 - Ivy in Use

![Image 4 of Ivy in Use](image4)
Figure 3 – Pieces & Parts

Figure 4 – Ivy in Storage
Table 1- Financial Estimations

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<tr>
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<td><strong>Initial Projected Income Statement</strong></td>
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<tr>
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<tr>
<td><strong>Gross Profit</strong></td>
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1. Units estimated as follows: Approximately 59 children’s hospitals in the U.S. with an average of 430 beds. Assuming that 75% of all facilities will acquire an average of 100 Ivy products yielding an estimate of 4,425 units. This estimation excludes potential sales to non-children’s hospitals as well as other healthcare facilities therefore may be a conservative estimation.
2. High and low price points are speculation and further market research data is needed.
3. Estimated total raw material costs are $5 per unit.
4. Costs of injection molds and tooling.