Flash Surgical, Inc. (“Flash” or the “Company”) is a medical device development company specializing in the commercialization of technology to improve robotic laparoscopic surgery by making the procedures faster, easier, safer, and more cost-effective.
The Problem:
Surgeons Need to Safely & Efficiently Establish a Laparoscopic Access Port

Surgeons insert trocars (ports) to gain entry to the abdomen as a first step in manual laparoscopic and robotic laparoscopic surgery. Direct entry (~30% of procedures) does not provide a video feed and is considered less safe. Optical entry (~70% of procedures) has a variety of drawbacks, especially for robotic laparoscopic procedures [1]:

**Ergonomically Difficult**

- Semi-rigid, hard-to-manage light guide
- Heavy, awkward laparoscope & camera head
- Requires 2 (large) hands, difficult to apply force.
- Ergonomically difficult, especially for older surgeons, surgeons with small hands, and for obese patients
- Surgeons are required to perform seven additional non-value added port steps

**Extra Equipment**

- Intuitive Surgical Robotic Units
- Dedicated Optical Entry Laparoscopic Tower & Laparoscope
- For Robotic Surgeries an additional laparoscopic tower is needed which can cost $30-$150k [2] and is often a main point of failure in the surgeries

**Extra Expense**

- Continuous maintenance on laparoscopic tower
- Sterilization of laparoscope after each procedure
- Increased labor from techs and doctors
- Longer procedure time due to complexity of optical entry process
- $100/procedure [3] of processing, cleaning, & sterilization due to extra equipment
- More setup & steps in the procedure, leading to longer procedure times & expenses

*Several studies suggest that the initial trocar insertion is the most dangerous aspect of trocar use, and possibly the most dangerous step in minimally invasive surgery* – FDA [4]

Sources:
[1] iData Research
[2] National Institutes of Health
[4] Laparoscopic Trocar Injuries: FDA
The Solution:
Single Use TroCam Video Obturator for Robotic Surgeries

- TroCam is a single use obturator with integrated video and illumination enabling the surgeon to perform entry and visualize placement of the remaining trocars.
- Surgeons view the TroCam video feed on the durable CDA tablet.
- Advantages include:
  - No extra equipment
  - Efficient, fewer steps
  - No sterilization required
  - Safest, visualized entry
The Complete Optical Entry Solution: Single Use, Disposable TroCam Obturator

**TroCam Key Features**

- Buttons: +/- digital zoom, +/- illumination
- Latches & locks to cannula
- Length available in standard sizes
- LEDs physically separate from sensor = no glare
- Custom optics to correct distortion from conical tip
- Symmetrical tip for high optical quality

**Working Prototype**
**TroCam Simplifies Port Placement**

**Elegant TroCam Port Placement Process**

1. Have a dedicated laparoscope, light guide, display tower, and 5mm trocar
2. Perform optical entry with 5mm trocar & dedicated laparoscope
3. Remove obturator & laparoscope from cannula
4. Remove laparoscope from obturator
5. Reinsert laparoscope back into 5mm cannula
6. Place 2-4 additional 8mm robotic trocars, visualized from inside
7. Remove laparoscope from 5mm cannula
8. Insert laparoscope into one of the 8mm robotic trocars
9. Remove the 5mm cannula
10. Insert an 8mm robotic trocar where the 5mm was removed
11. Remove the laparoscope

**TroCam Eliminates Robotic “Port Hopping”**

<table>
<thead>
<tr>
<th>Current Method – “Port Hopping”</th>
<th>TroCam</th>
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<tbody>
<tr>
<td>1. Have a dedicated laparoscope, light guide, display tower, and 5mm trocar</td>
<td>1. Have a TroCam available along with normal 8mm cannulas</td>
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<tr>
<td>2. Perform optical entry with 5mm trocar &amp; dedicated laparoscope</td>
<td>2. Perform optical entry with 8mm cannula &amp; TroCam obturator</td>
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<td>4. Remove the TroCam from cannula</td>
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**Fewer Steps. Less Time. Less Equipment.**
### Additional Benefits of the TroCam

#### Equipment [1]

**Current Approach – “Port Hopping” [1]**
- 1x 5mm Optical Trocar
- 1x Dedicated Laparoscope Cart
- 1x Camera Head
- 1x Laparoscope Rod Lens
- 1x Camera Control Unit
- 1x Image Capture Device
- 1x Light Source
- 1x Light Guide
- 1-2x Medical Monitors
- 1x Video cable, other cables
- 2-4x 8mm reusable cannulas
- 1x single use 8mm obturators

**TroCam Approach**
- 1x TroCam
- 1x CDA Tablet
- 2-4x 8mm reusable cannulas
- 1x single use 8mm obturators

#### Time to Dock [2]

**Primary Focus**
- Decrease the time a surgeon takes to make the initial port entry compared to the laparoscopic tower

**Secondary Focus**
- Reduce set-up time and robot docking
- Improve trackable outcomes such as blood loss, complications, others

#### Cost Savings [3]

<table>
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<tr>
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<tbody>
<tr>
<td>Sterilization Savings</td>
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<tr>
<td>Equipment Savings</td>
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<tr>
<td>Maintenance Savings</td>
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<tr>
<td>TroCam Cost</td>
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<tr>
<td>Contamination Savings</td>
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<tr>
<td>Capacity Savings</td>
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<tr>
<td>Direct Labor</td>
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<tr>
<td>TroCam Annual Savings</td>
</tr>
</tbody>
</table>

Annual costs assuming $175 TroCam price & 225 robotic procedures per year

#### Additional Non-Monetary TroCam Benefits
- Capex → Opex
- Preferred ergonomics
- Improved visualization entry
- Reduced OR footprint
- Increased patient safety
- Adoption of the safest entry method
- Streamlined process with fewer steps
- Simpler scheduling, asset utilization

**Sources:**
[1] Flash management interviews
[2] Various clinical studies on current method procedure times available upon request
[3] eBay, Bimedis, Boston Scientific, Ho C, Tsakonas E, Tran K, Sommers Schwartz,