

GRANT APPLICATION FOR FISCAL YEAR 2024

DIRECTIONS: Please complete the entire form. If appropriate, indicate "Not Applicable" and justify. The original application plus an electronic version is due in The Women's Board office on or before 4:00 pm on Friday, January 6, 2023. Only one (1) application from each department will be accepted. Late or incomplete applications will not be considered.

DATE: 01/06/2023

CLINICAL DEPARTMENT: GYN/OB

CONTACT PERSON: Jenell Coleman, MD

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Email: colemanj@jhmi.edu


TITLE OF REQUEST: *Expanding the Reach of The Violet Project: Implementing a Smart Healthcare Vending Solution to increase youth access to sexual healthcare*

PHYSICAL LOCATION OF PROJECT: Johns Hopkins Outpatient Center (Women's Health Clinic) and Johns Hopkins Hospital GYN/OB Clinic (Nelson 2)

ABSTRACT (Non-technical overview - 150 words or less):

The Violet Project (violetproject.org) was developed to address poor access to sexual and reproductive healthcare and education among Baltimore City youth. "Violet" has three prongs: a digital health platform, clinical care ancillary services, and community outreach. To further expand our reach, we propose implementing smart, self-service healthcare vending machines in two of our OBGYN clinics. With an interactive touchscreen, the smart healthcare vending machines will allow our patients to access educational materials, free menstrual supplies, condoms, and self-collected STI test kits. All products will be dispensed in plain, non-descript packing to allow for privacy. Content for the smart healthcare vending machines will focus on sexual health (e.g., STI fact sheets, self-testing resources, proper condom use), reproductive health (e.g., menstruation, anatomy), gender and sexuality, and healthy relationships. Our project embodies the Hopkins' vision to "transform health care and create hope for humanity" and will have a significant impact on our patients.

SIGNATURE OF CLINICAL DEPARTMENT CHAIRPERSON:



(Please type) **Chairperson Name:** Andrew Satin, MD

Chairperson Title: Professor of Gynecology & Obstetrics

Chairperson Email: asatin@jhmi.edu

NOTE: Questions 1-6 must be answered. Please be thorough and concise.

1. Impact on patient care:

The Violet Project (violetproject.org) is a social enterprise developed in response to poor access to sexual and reproductive healthcare and education among youth living in Baltimore City. From patients without access to period products, to patients experiencing extreme morbidity because of a lack of education about their bodies, our team recognized a real need to ensure equitable access to care and education for youth. So, The Violet Project was born. "Violet" has three prongs: a digital health platform, clinical care ancillary services, and community outreach. The digital health platform contains comprehensive, easily understandable, and interactive educational content tailored for youth and a free online store. The online store (violetproject.org/store) contains safer sex products (external/internal condoms, lube, dental dams), self-collect sexually transmitted infection (STI) test kits (with personal health information stored on a Hopkins secured database), and period products (period cups, sanitary napkins, and tampon packs). The online products are postage-paid and shipped to any youth 26 and under in Maryland. A board-certified OBGYN provides all positive STI test results, counseling, and free treatment.

In September of 2021, our team was awarded a community collaboration grant to build a youth advisory board to help inform our efforts, including an in-depth review of our digital health platform. Our youth reviewed the website's content and helped us create material tailored to a low-health literacy population. They are still involved with helping us crowdsource donations for safer sex products and period products, spreading awareness of the resource at large community events (e.g., Fiesta Baltimore, Baltimore Pride), and shipping our free online store products. As a result of our success, we have grown to have a volunteer database of nearly 400 youth.

The Violet Project's impact on hard-to-reach populations has been tremendous. Our website receives 2,000 unique-users every month, and our social media platforms reach over 7,000 accounts every month. In the past year (December 7, 2021 – December 1, 2022), The Violet Project's digital health platform has fulfilled 881 orders, 307 of which were self-collect STI test kits (averaging 26 test kit orders/month). The STI test kit orders are mailed to zip codes with the highest STI rates, which attests to **our goal of affording access to sexual health care for those most in need**. Additionally, the clinical care ancillary services are very well received by patients and providers alike. Sexual and reproductive peers attend nine outpatient settings and the two emergency rooms at JHH and Bayview to provide brief educational lessons to youth and dispense free products. These lessons include topics such as safer sex, birth control, and menstruation for youth patients. Despite only launching six months ago, the clinic services have reached 484 patients.

To further expand The Violet Project's reach, we propose implementing smart, self-service healthcare vending machines in key high-traffic areas of two of our OBGYN clinics. Self-service vending machines have been utilized for years in other sectors, allowing clients to perform simple tasks independently. The earliest example is the manual vending machine, dating back to the 1600s in England, where brass vending machines would vend tobacco. Then, vending machines to dispense newspapers were invented in 1822. Today, vending machines have evolved to include intelligent vending technology like touchscreens, barcoding, and RFID. Some common self-service vending machine examples include those dispensing food items, clothing, and skin care items (Figure 1A-E). The healthcare industry has

embraced vending solutions for hospital or clinic supplies and medication management (e.g., pyxis); however, it is only beginning to realize the benefits of self-service vending solutions for patients to access directly. In fact, there is at least one self-service kiosk on the Homewood campus for student health clients (Figure 1A), and other universities have Covid-19 test dispensing smart vending machines (Figure 1C). In other countries, such as Australia and the United Kingdom, smart vending machines are widely successful in sexual health clinics. One study reported that adolescent people preferred self-testing and self-sampling over traditional testing,¹ which may be an effective strategy to increase STI testing efficiency and case detection.²

Figure 1A-E. Example self-service vending machines.



With an interactive touchscreen, the smart healthcare vending machines will allow our patients to access additional sexual and reproductive health educational materials, menstrual supplies (e.g., pads, tampons, menstrual cups), condoms, and self-collected STI test kits. All products will be dispensed in plain, non-descript packing to allow for privacy. Content for the smart healthcare vending machines (Figure 2) will focus on sexual health (e.g., STI fact sheets – Figure 2A, self-testing resources – Figure 2B, proper condom use – Figure 2C), reproductive health (e.g., menstruation – Figure 2D, anatomy, menstrual cups), gender and sexuality – Figure 2E, and healthy relationships – Figure 2F. The smart healthcare vending machines will offer packs of: internal condoms, external condoms, dental dams, pads, tampons, period cups, and STI test kits. All materials can be viewed on violetproject.org/store. Machines will be networked to a Hopkins' server, allowing secure collection of data regarding usage and monitoring of vending machine functionality. To ensure that the smart vending machines are not abused, there will be a few limits on the number of free products that can be retrieved (e.g., only 1 period cup/month).

[illegible]

Baltimore City is home to a group of particularly socially vulnerable youth; in fact 80% of Baltimore County Public School students receive free or reduced-priced meals at school based on financial need.³ Based on our pilot test of violetproject.org and in-clinic product distribution, we anticipate the smart vending machines reaching 500 unique patients/year. The smart vending machines will provide increased access to free STI testing services (as well as another space for STI test kit return) and increased access to free safe sex products and period products.

While youth are in the clinic, they would be given a unique code to retrieve any items of their choice from the smart healthcare vending machine. No other personal information would need to be inputted into the machine by the patient. For example, if a patient wants an STI test kit, their unique code will be linked to an existing code inside the STI test kits. Our Violet

Project staff would retrieve returned kits from the machines weekly and use our existing infrastructure through The Violet Project to deliver results and link patients to care.

To drive further use of the machine, we will create an Epic alert to ask OBGYN clinic providers if they would like to place an Epic order for their adolescent and young adult patients to use the vending machine. The order would generate a barcode, similar to the current system used in clinics for labeling, for use on the machine. The vending machine will provide different options for pregnant (using gestational age in Epic as a marker) and non-pregnant youth. In addition to ordering an STI test kit for themselves, youth patients can opt to dispense a test kit for their partner(s). Although we are focused on youth, providers may opt to create a barcode for any patient in need.

3. Significance:

Our proposed smart vending machines align with Johns Hopkins' mission *"to improve the health of the community and the world by setting the standard of excellence in medical education, research, and clinical care."*

In an ever-evolving political climate, increasing access to sexual and reproductive healthcare and education is more important than ever. Youth bear the burden of STIs and cases are rising. In 2021, there were more than 2.3 million reported cases of chlamydia, gonorrhea, and syphilis in the U.S.— representing the sixth consecutive year of increasing incidence rates.^{4,5} Treatment and prevention of STIs are of paramount importance for youth as untreated, recurrent, or persistent STIs such as chlamydia and gonorrhea infection increase the risk of HIV acquisition and may result in pelvic inflammatory disease (PID) in female youth.^{6,7} Those with recurrent PID have an increased risk of infertility and chronic pelvic pain.⁸ However, youth are tested for STIs at far lower rates than older individuals. For example, a national survey of youth found only 16.6% of sexually experienced females and 6.6% of males had been tested for an STI in the prior 12 months.⁹ Reasons for inadequate testing include concerns about privacy and confidentiality, stigma from peers and healthcare workers, and knowing where, when, and how to get tested.^{9,10} Although we may be nearing a post-pandemic world, clinics are still recovering from massive shutdowns during the COVID-19 pandemic, in which 83% of clinics deferred some STI services, with over 65% of clinics reporting a decrease in STI screening.¹¹ New and innovative strategies are needed to increase STI testing, which is a goal of The Violet Project. Given the stigma around STI testing, all products offered in the smart vending machines will have the same plain outside packaging to enhance privacy. Therefore, users should not feel like onlookers will know what they are getting from the machine.

Furthermore, nearly a third of a nationally representative sample of adolescents report engaging in sexual intercourse, but the prevalence of condom use was only 54%. Our smart vending machines will provide free access to condoms with educational material (both written and links to our website to view videos) on how to use condoms (Figure 2B) properly.

Our smart vending machines will also help bridge gaps in period poverty. Globally, millions of people suffer from inadequate menstrual hygiene, whether because of a dearth of menstrual supplies, no safe space to use those supplies, or social stigma.^{12,13} Poor menstrual hygiene management is associated with lower quality of life, both mentally and physically, as well as a possible increased risk of infections.^{14,15} One group particularly vulnerable to menstrual hygiene inequity, or period poverty, is youth. Early research has estimated that

two-thirds of low-income women in the U.S. face period poverty. Also, youth are more likely to miss work or school due to their periods compared with adults, with one survey among low-income high schoolers finding that 70% missed school due to menstruation.^{16,17} By making free period products more accessible, we can help youth participate in activities for positive youth development and prevent adverse outcomes related to unsafe menstrual hygiene.

Our goals with The Violet Project and the proposed new healthcare vending machines are to increase patient engagement, improve health literacy, and enhance patient satisfaction. As healthcare industry leaders anticipate exponential growth of medical vending machines by 2030, Hopkins will continue to *"transform health care and create hope for humanity."*

4. Implications, if any, that this has to the Covid pandemic:

The idea of the smart vending machines was formed because of the Covid-19 pandemic. The pandemic sparked the adoption of many self-service equipment, including Covid-19 testing. Covid-19 smart vending machines are located on several academic campuses, and availability is sometimes 24 hours. To impact our patients, we propose adopting such technologies to supplement their sexual and reproductive care.

Furthermore, because of the Covid-19 pandemic, smart vending machines boast several sanitizing solutions, such as UV-C technology. UV-C is a germicidal light that deactivates 99% of the DNA of bacteria, viruses, and other pathogens, destroying their ability to multiply and cause disease without using chemicals. The screen, delivery bin, and peripherals are disinfected within 30 seconds or less following every patient's machine use. When the patient steps away from the machine, it automatically disinfects itself. Sensors on the machine detect when it is in use and when the person has walked away, prompting it to begin a 30-second disinfection cycle. If a person wants to use the machine during the cycle, it senses the human presence and suspends the disinfection process, resuming the process when the person walks away.

5. Personnel (Please note that we cannot fund grants that incorporate any salaries.)

Jenell Coleman, Divisional Director of GYN Specialties – no salary support requested
Saumya Sao, Research Program Coordinator – no salary support requested

6. Budget: Total Request: \$69,415

A. Equipment - price per item and discount if applicable for multiples. Please add compelling justification if multiples are requested. (Itemize and justify):

Intelligent Dispensing Solutions (IDS) costs:

Total Hardware SD5000-TS: \$7,620.00

Total Hardware SD5000-TS: \$7,620.00

Attached 20 Door Locker w/Graphics: \$5,720.00

Attached 20 Door Locker w/Graphics: \$5,720.00

Annual Software Fee: \$600.00

Annual Software Fee: \$600.00

-A locker is attached to the vending machine to serve as a return spot for STI test kits.

-The "SD5000-TS" has a touchscreen, barcoding, and UCV sanitation technology.

-We request one full setup (vending machine, secure locker, and software) for JHOC, and one for Nelson 2. Vending machines will be branded with our logos.

B. Supplies (Itemize and justify):

We have an entire storage unit in Carnegie organized to fulfill orders from our free online store and keep our clinic sites stocked with products. We have a large amount of space to keep products that do not expire for long-term use. We anticipate creating two thousand sanitary napkin packs (each pack given includes 5 pads), two thousand tampon packs (each pack given includes 10 tampons), 200 period underwear, and 200 period cups each year..

Item	Price per item	Total cost
10,000 maxi pads	\$0.12	\$1,200
14,000 thin pads	\$0.09	\$1,260
28,000 underwear liners	\$0.04	\$1,120
20,000 regular tampons	\$0.07	\$1,400
10,000 super tampons	\$0.08	\$800
4,000 period pack bags and infographics	N/A (bulk cost)	\$1000
200 period underwear	\$39	\$7,800
200 period cups	\$39	\$7,800
200 bottles of period cup wash	\$9	\$1,800
200 period cup infographics and contact cards	N/A (bulk cost)	\$60
300 STI Test Kit Assays, 2 site	\$48	\$14,400
300 Test kit packaging	\$9.65	\$2,895
Supplies sub-total: \$41,535		

C. What is the out-of-pocket cost to the patient? (Itemize and justify): None

D. Other Expenses, Hidden Costs (Please consider whether your grant proposal contains other costs that would require hospital funding, such as structural modifications for equipment installation, operating costs such as additional FTEs, training costs, etc.)*None.

7. Have you requested funds from any other source?

☒ Yes (What was the result?)

We received funding from Hologic, Inc. and a donation of STI test kits that have helped us run STI testing assays. However, this funding will not be able to cover our expansion of test kits through the proposed vending machines, which is why we requested a separate pool of funds for packaging test kits and running assays for the vending machine test kits.

☐ No (Explain why)

References

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January 6, 2023

Ms. Anne Robotham
President, The Women's Board

Ms. Andrea Tucker
Chair, Hospital Relations Committee
The Women's Board of the
Johns Hopkins Hospital
Billings Administration Room 221
600 N. Wolfe Street
Baltimore, MD 21287

Dear Ms. Robotham and Ms. Tucker:

I am very pleased to submit this request for Women's Board funding for the Department of Gynecology and Obstetrics for Fiscal Year 2024. The department would like to implement smart, self-service healthcare vending machines in two JHH GYNOB based clinics, as part of the Violet project. The Violet project provides access to sexual and reproductive healthcare and education among the youth in Baltimore City. The smart healthcare vending machines will allow patients to access educational materials, free menstrual supplies, condoms, and self-collected STI test kits. Content for the smart healthcare vending machines will focus on sexual and reproductive health as well as gender and sexuality, and healthy relationships. The request embodies the Hopkins' vision to "transform health care and create hope for humanity".

This support from the Johns Hopkins Hospital Women's Board will have a direct impact on the socially vulnerable youth of Baltimore City.

I want to thank you in advance for your consideration of this proposal and interest in improving the healthcare of the local community.

Yours sincerely,

A handwritten signature in black ink that reads "Andrew J. Satin MD".

Andrew J. Satin, MD
Dorothy Edwards Professor and Director