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From Clinic to Community: Deploying Harm Reduction Vending Machines Across a Veterans Affairs System

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ABSTRACT Harm reduction vending machines (HRVMs) can expand low-barrier access to overdose prevention, sexual health, safer-use, and basic self-care supplies; however, practical guidance for implementing HRVMs in health system and supportive housing settings is limited. This practice report describes a clinical pharmacist practitioner (CPP)–led deployment of 15 HRVMs across a Veterans Affairs (VA) system and Veterans supportive housing in California. Beginning in December 2021, the CPP conducted site engagement, market research, and funding applications; convened cross-departmental stakeholders (logistics, engineering, biomedical, environmental management, information security/technology); and completed contracting. Contracts were awarded to VendNovation, LLC, for HRVMs which were placed in 7 community-based outpatient clinics, 6 supportive-housing sites, and 2 hospital locations. The CPP designed the HRVM wrap and interior layout; curated product assortments (eg, fentanyl/xylazine test strips, syringes, safer-sex supplies, wound-care, and hygiene items; naloxone added after launch) based on prior quality improvement interventions and Veteran feedback surveys; and established barcode-based user access and software-enabled inventory management. Implementation challenges included staff concerns (eg, stigma, not in my backyard attitudes), connectivity barriers (eg, Wi-Fi requirements), and added costs for deliveries to non-VA locations. HRVMs within VA clinics were accessible during business hours; supportive-housing HRVMs operate 24/7. Planning and installation required nearly 2 years, underscoring the need for dedicated staffing (CPP plus logistics technician), braided funding for start-up and recurring costs, and standardized purchasing and installation pathways. HRVMs seem feasible and acceptable in VA clinical and housing settings and may increase anonymous, low-barrier access to harm-reduction supplies. Implications for scale-up include development of centralized or prevetted procurement pathways, clearer implementation guidance, and operational supports to reduce site-level contracting burden.

KEY WORDS: harm reduction, pharmacists, vending machine

Background

The United States faces a high burden of drug-related morbidity and mortality, with provisional national data indicating more than 105,000 overdose deaths in 2023 and a persistently high health toll driven by fentanyl.[1] Injection-related skin and soft-tissue infections and infective endocarditis also remain elevated, and people who use drugs experience disproportionate rates of sexually transmitted infections (STIs), underscoring the need for prevention modalities that are both effective and accessible.[2–5]

Syringe services programs (SSPs) are essential components of harm reduction; however, when SSPs

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operate during business hours or require face-to-face interactions, access is constrained—limitations that were magnified during the COVID-19 era and are particularly salient in health system–based programs, such as those within the Veterans Health Administration (VHA).[6–10] These constraints impede timely access to supplies and place heavy demands on staff capacity for outreach and referral-based enrolments.

Harm reduction vending machines (HRVMs) emerged as a complementary model designed to overcome barriers by offering anonymous, low-/no-cost, 24/7 access to overdose prevention, safer-use, sexual health, and self-care supplies.[11] Evaluations consistently demonstrate that HRVMs improve anonymity, acceptance, accessibility, and convenience—key determinants of engagement for individuals who avoid storefront/clinic-based programs due to stigma, limited hours, transportation, or cost.[12–16] Beyond widening access, HRVMs can strategically extend reach into rural and other underserved settings where traditional harm reduction infrastructure is sparse.[17–20] In these contexts, HRVMs can help decouple supply access from staff-intensive outreach, directly addressing scalability challenges while preserving low-barrier engagement.

HRVMs are adaptable to local needs, can integrate referral pathways to broader services, and have been deployed across diverse community and clinical venues, illustrating fit for expansion into new settings, including those serving Veterans.[13,21] Importantly, HRVMs are cost-conscious and have not been associated with increased public drug use, unsafe syringe disposal, crime, or vandalism, addressing common community concerns and supporting sustainability.[22] These features make HRVMs a practical mechanism for scaling harm reduction services without proportionally scaling staffing, while normalizing access to supplies that prevent overdose, infections, and related harms.[23–25]

A clinical pharmacist practitioner (CPP) led implementation of HRVMs within the San Francisco Veterans Affairs Health Care System (SFVAHCS) and Veterans supportive housing settings to expand geographic reach, including rural and underserved areas; reduce reliance on in-person encounters/referral workflows; and deliver low-barrier, around-the-clock access to free, lifesaving, and infection-prevention supplies.[26] Implementation planning and evaluation were informed by the RE-AIM framework (Reach, Effectiveness, Adoption, Implementation, Maintenance) to ensure attention to key domains relevant to real-world deployment and sustainment.[27] Consistent with a practice-report focus, we use RE-AIM as a guiding structure at a high level rather than conducting a comprehensive domain-by-domain framework analysis. This article outlines phased implementation steps, including preimplementation, implementation, and maintenance/sustainment for deployment of 15 HRVMs in settings serving Veterans, with the goal of providing a transferable implementation roadmap for other VA and non-VA organizations considering HRVM adoption and scale-up.

Phase 1. Preimplementation

Phase 1 focused on building readiness for HRVM deployment by securing leadership and stakeholder support, establishing procurement and operational pathways, selecting candidate sites, and designing HRVMs/product specifications to support low-barrier access.

Stakeholder engagement and site selection

Preimplementation stakeholder engagement and site selection aimed to identify feasible locations and anticipate context-specific concerns (eg, product concerns, stigma, space constraints, connectivity requirements) that could influence adoption and placement. CPP-led implementation efforts began in December 2021 and included site engagement, market research, funding proposals/attainment (through national VHA Pain Management, Opioid Safety, Prescription Drug Monitoring Program [PMOP] office), convening cross-departmental stakeholders (pharmacy, logistics, engineering, biomedical, environmental management, information security and technology), executive leadership approval, and contracting.

HRVM exterior design

Exterior HRVM wrap design activities aimed to balance alignment with VA branding standards[28] and program identity with clear, stigma-free verbiage to support engagement, convey available resources, and facilitate service linkage (Supplemental File, http://links.lww.com/JPHMP/B683). Informal feedback from VA staff (including Veteran staff) colocated in areas of potential HRVM placement was incorporated. The front/side panels (Supplemental File, http://links.lww.com/JPHMP/B683) featured the Harm Reduction Program slogan, "Your Life Matters," and VA logo. The front panel included a quick response (QR) code to the program website and business cards with contact information. The side panels summarized key harms the program aimed to prevent and provided concise linkage information (eg, naloxone, infection testing resources, VA contacts, Veterans Crisis Line). The wrap was intentionally designed so

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the HRVM's purpose and available resources were immediately recognizable (rather than visually neutral) to support wayfinding, reduce uncertainty about what the HRVM offers, and normalize harm reduction as a health service in clinical and supportive housing settings. In our setting, clear identification was also viewed as important for program legitimacy and alignment with VA branding standards.

HRVM interior design and product selection

The interior configuration and product selection were codeveloped using product and HRVM dimensions to optimize usability, dispensing reliability, intuitive product navigation, and reduce restocking burden (Table 1). Initial product selection was designed to support a low-barrier model by prioritizing nonprescription supplies that 1) were informed from previous SFVACHS quality improvement (QI) projects and Veteran feedback surveys (Veterans with and without lived experience of substance use) and 2) normalized access through providing safer substance use materials alongside health and wellness items.[29–31] As summarized in Table 2, products included supplies for safer injection, other routes of substance use, overdose prevention, safer sex, and health/wellness. Naloxone was not stocked at initial launch because VA-issued naloxone required prescription dispensing and VA health care eligibility, which was incompatible with a low-barrier, nonprescription HRVM model.

Phase 2. Implementation

Phase 2 operationalized the program by delivering and installing HRVMs, launching site workflows and connectivity, training local points of contact (POCs), and addressing site-, vendor-, and systems-related barriers encountered during roll-out.

HRVM locations

Site selection and installation required iterative tailoring to local context, including space constraints, connectivity, security considerations, and stakeholder concerns, often necessitating contingency locations and revised timelines. HRVMs were initially planned for designated spaces in 9 health care and 6 supportive housing settings; as destinations were finalized, barriers emerged before/during delivery that required modifications in placement/timelines. Key implementation barriers and mitigation strategies are summarized in Table 3. In 1 supportive housing setting, media attention required coordination with the SFVAHCS Public Affairs Office to develop consistent messaging.

When challenges were aggregated by site type, distinct patterns emerged. Community-based outpatient clinic (CBOC) installations were typically feasible with minor space adjustments, whereas supportive housing sites often required substantial installation changes due to access constraints, security/visibility concerns, and connectivity limitations that delayed go-live. Hospital-based placements required greater negotiation around clinic-/leadership-level approval for physical space. Two planned locations (hospital, supportive housing) were ultimately installed in new locations.

Clinic-based HRVMs were accessible during regular business hours, whereas supportive housing HRVMs operated 24/7. Placement prioritized visibility and ease of access (eg, near entryways/high-traffic areas) to support wayfinding and normalize use; however, none were in fully private areas. In supportive housing, placement (eg, front lobby, community room, parking garage, bicycle room), access (eg, key card entry), and visibility (eg, proximity to front desk, security, cameras) varied. Overly secluded placement seemed to reduce awareness and uptake (eg, least used HRVM was in an out-of-the-way community room). Across sites, visibility, accessibility, and privacy were balanced within the space constraints of each location.

HRVM delivery, installation, and launch timeline

All HRVMs were initially delivered to the SFVAMC warehouse encased in packaging. Logistics Service delivered HRVMs to VA properties; non-VA property delivery required new vendor contracts at added cost (Table 3). Some sustained damage during delivery/moving (eg, bent door/base), and some wraps were discolored. Because HRVMs were not consistently unwrapped/inspected at warehouse receipt, the damage timing could not be confirmed, and warranty-covered repairs could not be pursued, highlighting the importance of inspection at delivery (Table 3).

HRVM installation included configuring coils/trays, stocking and test-vending products, setting up the cable modem/wi-fi antenna, completing web-based software training, and troubleshooting (eg, connectivity, key malfunctions, door/frame issues). HRVMs did not arrive with preprinted product labels; custom labels were printed and affixed next to the numbers using the DYMO LabelWriter 550. Labels faded and required replacement 1–2 times/year; more durable labelling approaches may be preferred. HRVMs went live starting August 2023 (10 HRVMs), September 2023 (4 HRVMs), and March 2024 (1 HRVM; delayed by connectivity).

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TABLE 1
HRVM Plan-O-Gram

Tray Height (in)	Product (Total Number of Products per Coil)									
8	Sharps container, 1qt (4)		Sharps container, 1qt (4)		Wound care kit (10)		Alcohol swabs (24)	Alcohol swabs (24)	Nonlatex tourniquet (24)	Nonlatex tourniquet (24)
6	Sharps container, 250 mL (6)		Sharps container, 250 mL (6)		Wound care kit (10)		Sterile water vial, 5 mL (24)	Rubber mouthpiece, (24)	Safer snorting kit (24)	Sunscreen, 0.25 oz (24)
6.75	Ascorbic acid powder, 3 g (24) [a]	Alcohol-free hand sanitizer spray, 1 oz (18)	Safer rectal use kit (15)	Cooker (24)	Fentanyl test strips (12)	Xylazine test strips (12)	Deodorant, 1.6 oz (15)	Lotion, 4 oz (9)	Alcohol-free mouthwash, 2 oz (10)	Lip balm tube (24)
7.5	Hygiene kit (12)		Hygiene kit (12)		Lubricated latex condoms (15)		Lubricated latex condoms, large/extra-large (15)		Water-based lubricant, 3 mL (15)	
6.5	Insulin syringe, 27 G, 16 mm, 1 mL (15)		Insulin syringe, 28 G, 12 mm, 1 mL (15)		Insulin syringe, 29 G, 12 mm, 1 mL (15)		Insulin syringe, 30 G, 12 mm, 1 mL (15)		Insulin syringe, 31 G, 8 mm, 1 mL (15)	
6	Insulin syringe, 27 G, 16 mm, 1 mL (15)		Insulin syringe, 28 G, 12 mm, 1 mL (15)		Insulin syringe, 29 G, 12 mm, 1 mL (15)		Insulin syringe, 30 G, 12 mm, 1 mL (15)		Insulin syringe, 31 G, 8 mm, 1 mL (15)	

Abbreviations: HRVM, harm reduction vending machine.
[a]*Ascorbic acid powder replaced with intranasal naloxone 4 mg, which fit 12 products per coil.*

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TABLE 2
Products the HRVMs Dispense, Vendors, Packaging, Dispensing Limits, and Changes Made Since Initial Implementation

Product (Contents)	Primary Vendor(s)	Clear Plastic Bag Size	Dispense Limit (Changes Made)
Alcohol swabs (10 swabs)	Total access group	3″ × 5″ or 4″ × 6″	7/week (changed from 1/day)
Ascorbic acid powder[a]	Total access group	3″ × 5″[b]	1/day
Cooker (1 cooker, handle, and cotton filter)	Donated from another VA health care system[c]	N/A	6/day
Deodorant	Safety works	N/A	1/week
Fentanyl test strips (10 test strips; 2 spoons 10-15 mg; instructions)	BTNX (test strips); DanceSafe (spoons)	4″ × 6″	2/week (↑ from 1/week)
Hand sanitizer spray	Total access group	N/A	1/week
Hygiene kit (2 washcloth tablets; 1 toothbrush, 0.3 oz toothpaste, 0.5 oz bar soap, and comb)[d]	Safety works	6″ × 5″[e]	2/week (↑ from 1/week)
Insulin syringes (10 syringes)	McKesson	6.5″ × 4[e]	2/day (↑ from 1/day)
Intranasal naloxone (1 device, instructions)	CDHCS NDP[c]	4″ × 6″	None
Condoms (10 condoms; 10 large or extra-large condoms)	Safety works; total access group; CDPH OA condom distribution program[c]	4″ × 6″ or 6″ × 6″[e]	2/week
Lip balm tube	Safety works	N/A	1/week
Lotion	Safety works	N/A	2/week (↑ from 1/week)
Lubricant (10 lubricant packets)	Total access group; CDPH OA condom distribution program[c]	4″ × 6″ or 6″ × 6″	2/week
Mouthwash	Safety works	N/A	2/week (↑ from 1/week)
Rubber mouthpiece	Safety works	3″ × 5″[b]	2/week (↑ from 1/week)
Safer rectal use kit (1 tuberculin syringe 1 mL, sterile water 5 mL vial, lubricant, body wipe, suppository, cooker, paperclip, wooden chopstick, and cotton)	Points of distribution	4″ × 6″[e]	2/day
Safer snorting kit (6 plastic straws; 2 condoms; 1 plastic razor blade, card, and scoop)	Points of distribution	3″ × 5″[e]	7/week (changed from 1/day)
Sharps container, 1 qt	Total access group	N/A	1/week
Sharps container, 250 mL	Total access group	N/A	1/week
Sterile water vial	Safety works	N/A	6/day
Sunscreen (3 sunscreen packets)	Points of distribution; Amazon	3″ × 5″ or 4″ × 6″	7/week (changed from 1/day)
Tourniquet	Safety works	3″ × 5″	7/week (changed from 1/day)
Wound care kit (6 skin closure strips; 2 sterile saline 5 mL vials, packets antibiotic ointment, nonalcohol towelettes, 4″ × 4″ gauze pads; 1 pair gloves, sterile saline 15-mL vial, and 2″ × 4″ bandage)	Safety works	8″ × 5.5″[e]	7/week (changed from 1/day)

(*continues*)

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TABLE 2
Products the HRVMs Dispense, Vendors, Packaging, Dispensing Limits, and Changes Made Since Initial Implementation (*Continued*)

Product (Contents)	Primary Vendor(s)	Clear Plastic Bag Size	Dispense Limit (Changes Made)
Xylazine test strips (10 test strips; 2 spoons 10-15 mg; instructions)	BTNX (test strips); DanceSafe (spoons)	4″ × 6″	2/week (↑ from 1/week)

Abbreviations: CDHCS, California department of health care services; NDP, naloxone distribution project; CDPH, California department of public health; OA, Office of AIDS
[a]Manually labeled with product name, lot number, and expiration date. Removed from the HRVM due to low use for harm reduction purposes and replaced with intranasal naloxone (April 2025).
[b]Product required packaging after pilot testing (too small and fell through the HRVM coil).
[c]Product attained at no-cost.
[d]Manually added razor, shaving gel, and dental floss (August 2025).
[e]Product prepackaged in a clear plastic bag.

Product packaging and dispensing limits

Products were dispensed as free-standing items or packaged in clear plastic bags (manually or prepackaged; Table 2). Clear packaging facilitated rapid product identification, reduced selection errors, and improved dispensing reliability. During pilot testing, very small products were manually packaged in clear bags to prevent coil slippage. Dispensing limits were set at the Veteran-level (ie, daily/weekly limit applied across all HRVMs) and established based on CPP estimates of Veteran usage. Most limits were modified over time with informal Veteran feedback and operational observations (eg, products stuck, insufficient quantity for Veteran/peers).

TABLE 3
Common Implementation Barriers and Mitigation Strategies for HRVM Deployment

Barrier Category	Barrier Examples	Mitigation	Planning Takeaway
Site-related	Placement concerns (stigma/NIMBY; perceived enabling; suicide concerns); visibility/privacy constraints	Early site engagement; identify local champions; prepared communications plan; adjusted placement (entryways vs. secluded areas)	Plan for structured site readiness + stakeholder engagement before delivery
Site-related	Physical space/access (doorway/elevator clearance; limited wall/footprint space)	Site walkthroughs, and measurements; contingency locations	Build a placement "plan A/B" for each site
IT/connectivity	Wi-fi/cable modem requirements delayed go-live	Documented network plan; coordinate with IT; install modem/antenna	Connectivity is a critical path item, confirm early
Vendor/delivery	Delivery damage; uninspected packaging limited warranty claims	Immediate unwrapping/inspection on arrival; document damage	Inspect at delivery to preserve warranty options
System/administrative	Deliveries to non-VA properties required separate contracts/added costs	External delivery vendor contract	Budget/plan for non-VA delivery constraints
Supply chain/logistics	Bulk purchasing required significant storage and packaging capacity	Centralized storage (multiple rooms → Conex container), standardized packaging; added logistics technician role	Include storage footprint + packaging workflow in planning; staffing must match supply volume
Communications/media	Negative media attention at 1 housing site	Coordinated with public affairs; prepared consistent messaging; program lead interviewed	Prebrief public affairs and develop FAQs/talking points

Abbreviations: FAQ, frequently asked question; HRVM, harm reduction vending machine; IT, information technology; NIMBY, not in my backyard; VA, veterans affairs.

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Product purchasing, delivery, and storage

Products were purchased through funding from National VHA program offices (PMOP; Mental Health and Suicide Prevention; Rural Health; Academic Detailing); some were obtained at no cost (Table 2). Orders were placed/received through Logistics Service after vendor registration and internal vendorization. Products were ordered in bulk to reduce costs, which created substantial storage needs. Products were initially stored in 4 areas across the SFVAHCS campus (Supplemental File, http://links.lww.com/JPHMP/B683) and later transferred to a designated outdoor Conex shipping container (Supplemental File, http://links.lww.com/JPHMP/B683) with a partial second for overflow. Each HRVM also include 2 bottom shelves to accommodate product storage.

Veteran access

Team members who participated in the sign-up process included the CPP, pharmacy trainees, and volunteer points of contact (POC) stationed in HRVM location(s). The CPP and pharmacy trainees offered multimodal Veteran sign-up through Veteran self-referrals by phone, in-person outreach (eg, Veterans supportive housing, outreach events), and direct referrals from VA staff (electronic medical record consult, e-mail, instant messaging). POCs also provided ad hoc Veteran sign-ups at HRVM locations.

Interested Veterans (including healthcare ineligible Veterans) completed a 5–10-minute one-time sign-up for access to all 15 HRVMs. Sign-ups included orientation to HRVM use and available products, optional demographic questions, and resource linkage (overdose education, community-based harm reduction programs, substance use treatment, infection testing/care). Before naloxone was stocked in HRVMs, Veterans were offered prescription naloxone or community-based linkage upon sign-up. Sign-up and resource acceptance were recorded by staff in an electronic VA Research Electronic Data Capture survey (Supplemental File, http://links.lww.com/JPHMP/B683).[32,33] From August 1, 2023, to August 31, 2025,

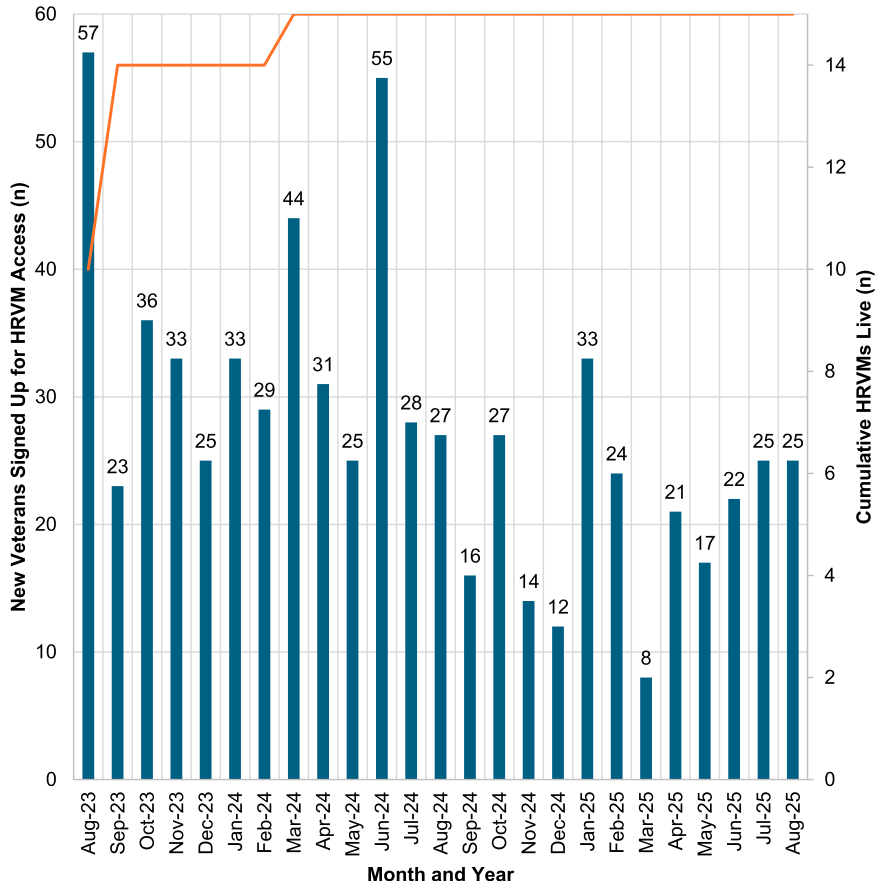


FIGURE 1 Figure 1 shows monthly new veteran sign-ups for HRVM access (bars; left y-axis) and cumulative number of HRVMs live (line; right y-axis), August 2023-August 2025. A total of 690 veterans signed up for access. Ten HRVMs launched in August 2023, 4 additional HRVMs launched in September 2023 (total 14), and 1 additional HRVM launched in March 2024 (total 15). Abbreviations: HRVM, harm reduction vending machine.

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a total of 690 Veterans signed up for HRVM access, an average of 27.6 ± 11.6 Veterans/month (Figure 1). Sign-ups reflected Veterans granted access to the HRVM network; detailed evaluation of unique post–sign-up HRVM users is being reported separately and was outside the scope of this practice article.

After sign-up, Veterans received a laminated wallet card displaying a unique, nonexpiring bar code and number (ie, 1 unique bar code/number per Veteran). All HRVMs were designed with a bar code scanner. Veterans could either scan the bar code or enter the 4-digit number to access any of the 15 HRVMs. Challenges included wallet card loss and durability issues, and replacement cards were provided when needed, with the original assigned code/number deactivated.

POC identification, training, and support

POC recruitment targeted 2–3 staff per HRVM location. Training (group, individual) included harm reduction principles, nonjudgmental communication, HRVM operations, and sign-up procedures; role plays supported comfort discussing harm reduction resources (unconditional positive regard).[34] POCs received standard work guidance (Supplemental File, http://links.lww.com/JPHMP/B683) and Veteran-facing handouts (eg, overdose education/naloxone, community-based SSPs, SFVAHCS treatment resources). A Microsoft Teams group supported streamlined communication, resource sharing, and troubleshooting; additional training and office hours were offered early in implementation and as needed thereafter. POCs represented diverse disciplines and roles, including clinical, behavioral health, outreach, administrative, and peer staff. This multidisciplinary model[35–37] supported on-demand assistance for Veterans and cross-coverage when the CPP was unavailable; however, sustained participation was limited by staffing shortages, competing duties, and supervisor approval.

Inventory management

The SFVAHCS HRVMs were smart vending machines with web-based software, which was used to create a virtual inventory supply room for each HRVM location. Products (type, quantity, lot number, expiration date) were added to virtual supply rooms and physically transferred to each HRVM location (interoffice mail, USPS/UPS, hand delivery). Inventory distribution was tracked proactively through web-based software and replenished as needed.

Phase 3. Maintenance and Sustainment

Phase 3 emphasized sustainment by stabilizing staffing and logistics workflows, securing recurring resources for maintenance and replenishment, and using dispensing and inventory data to guide ongoing QI/program expansion.

Staffing model

Sustainment required a staffing model that paired clinical leadership with dedicated operational support to maintain inventory, packaging, restocking, and troubleshooting issues across multiple sites. Initially the program was solely staffed by the CPP (funded by National VHA Office of Mental Health and Suicide Prevention), but solo staffing was not feasible for continuity, growth, and other responsibilities. Short-term national funding was obtained for a dedicated Logistics Service technician and transitioned locally after 1–2 years. The technician role is supervised within Logistics Service and operationally partnered with Pharmacy Service; the technician supported receiving, packaging, shipping, and stocking inventory, while the CPP provided program oversight.

Funding and cost considerations

Sustaining HRVMs required braided funding and deliberate planning for both start-up and recurring costs, given that the program does not have a dedicated funding pathway. Start-up costs included HRVM procurement, delivery/installation, exterior wrap/labeling, site readiness work (eg, connectivity set-up), initial products/packaging materials, and staff salary. Recurring costs included telecommunications/connectivity, software, and annual maintenance contracts, ongoing products/packaging, periodic hardware replacements/modifications (eg, coils, wheels), and staff salary.

In our program, recurring wi-fi, software, and annual maintenance costs are supported by a SFVAHCS Logistics Service contract with VendNovation, LLC; naloxone, condoms, and lubricant are obtained from state-based sources when available; and remaining products/equipment are supported by Logistics Service. Resources are supplemented when possible through VHA special purpose funds and research/QI funding. A detailed economic evaluation, including utilization-standardized metrics (eg, cost per item dispensed and per machine-month), is being examined in a forthcoming analysis led by our statistics/economics team.

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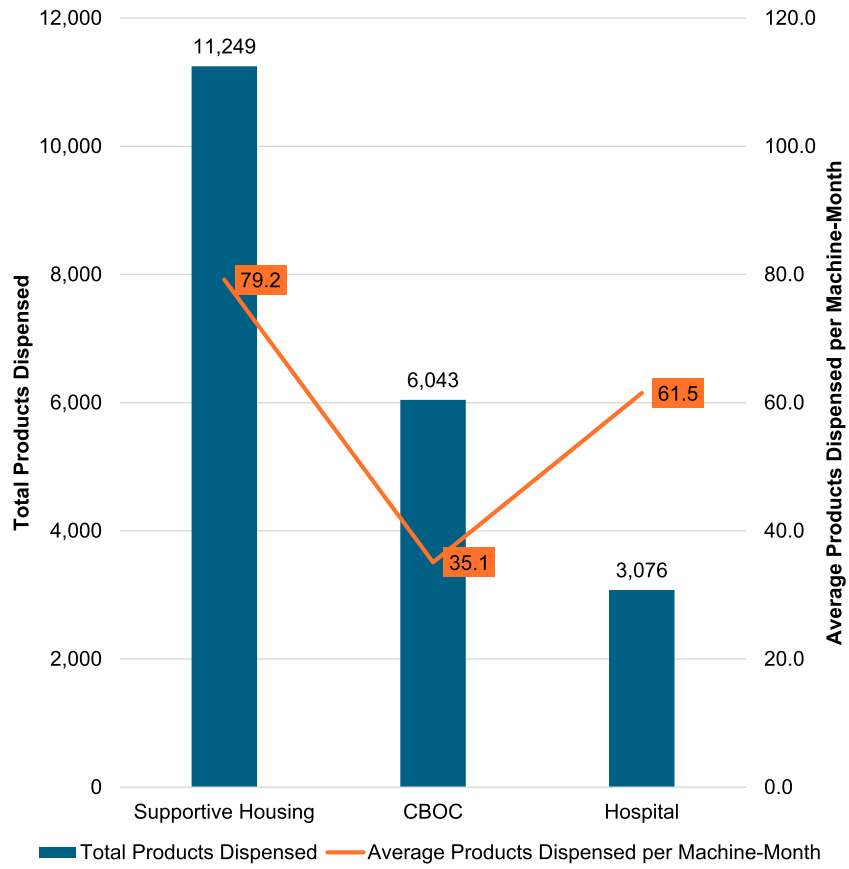


FIGURE 2 Figure 2 shows total products dispensed (bar) and average products dispensed per machine-month (line) for supportive housing, community-based outpatient clinics, and hospital-based settings. Average products dispensed per machine-month were calculated by dividing total products dispensed by the cumulative number of months each machine was operational during the evaluation period. Abbreviations: CBOC, community-based outpatient clinic; HRVM, harm reduction vending machine.

Product optimization and updates

Sustainment required periodic refinement of the product mix in response to utilization patterns and access feasibility. After enrolment in the California Department of Public Health Naloxone Distribution Project, naloxone was added to HRVMs in April 2025, replacing ascorbic acid powder (low use for harm reduction per formal/informal Veteran feedback). Early naloxone dispensing patterns should be interpreted cautiously, as naloxone became available later than other products and some Veterans had already been offered prescription or community-based linkage during sign-up before naloxone was stocked in the HRVMs.

Monitoring, evaluation, and continuous improvement

Dispensing and inventory data supported continuous improvement by enabling proactive restocking, identifying high-demand items, and informing sustainment planning/future evaluation priorities. Routine monitoring also guided operational adjustments, including refinements to packaging and stocking decisions as dispensing patterns emerged over time.

Data from the HRVM web-based software (HRVM location, date, time of day, product type, quantity) were used to evaluate distribution outcomes. Across site types, supportive housing HRVMs accounted for the greatest number of products dispensed overall (11,249), followed by CBOCs (6,043) and hospital (3,076) settings (Fig. 2). After accounting for differences in time in operation, supportive housing HRVMs also had the highest average products dispensed per machine-month (79.2), compared with hospitals (61.5) and CBOCs (35.1).

As shown in Figure 3, the most common products dispensed were syringes (all sizes, n = 3119), wound care kits (n = 1845), and alcohol swabs (n = 1759). The 31-G size of insulin syringes accounted for the highest proportion of syringes dispensed (n = 1209). Low early naloxone dispensing reflects addition after initial launch (April 2025). Together, these data systems strengthened sustainment by linking utilization to inventory workflows, budgeting, and funding requests.

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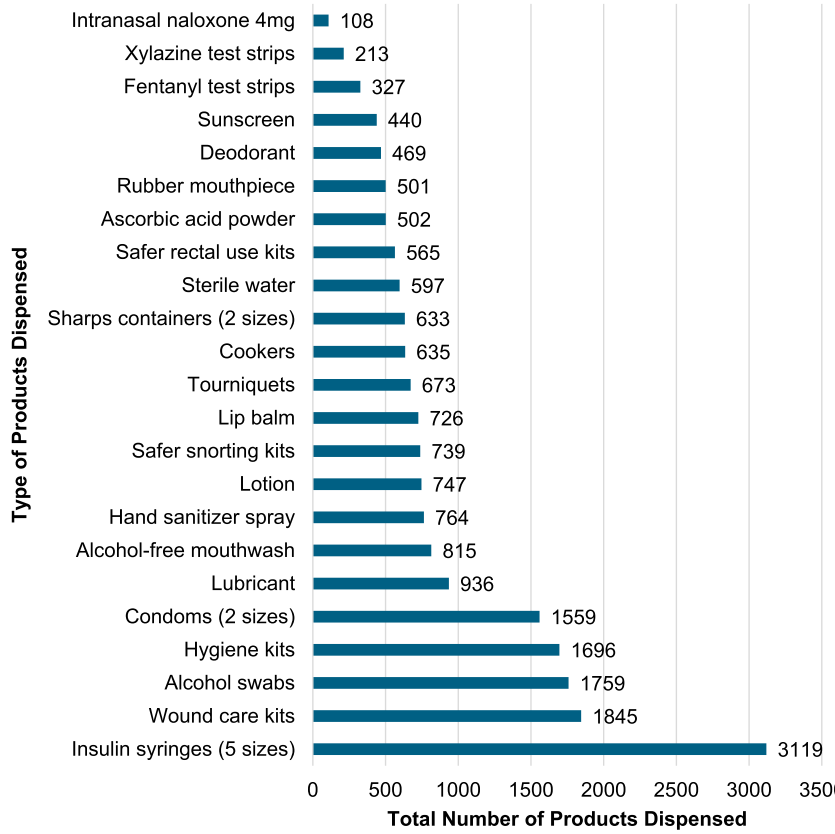


FIGURE 3 Figure 3 shows the total products dispensed across all HRVM sites from August 1, 2023, to August 31, 2025 (n = 20,368). For presentation clarity, selected items were collapsed into category totals: Insulin syringes, condoms, and sharps containers. Naloxone was added to the HRVMs in April 2025 and replaced ascorbic acid powder; totals for these therefore reflect different periods of availability from other products.

Discussion

Implementation across VA clinics and supportive housing sites yielded practical lessons for feasibility, equity of reach, and long-term operations. These findings support the need for standardized HRVM implementation toolkits (eg, site readiness checklists, procurement templates, product packaging/specifications, staff training materials, monitoring dashboards) to support scale-up and replication.[13,38,39] We also made design choices intended to reduce uncertainty and support self-directed use (eg, clearly labeled exterior wrap, standardized packaging to improve product identification/dispensing reliability). Design choices related to HRVM visibility, placement, and packaging may require adaptation across settings depending on local priorities around stigma, privacy, navigation, and operational feasibility. Future work should evaluate user preferences and privacy/stigma trade-offs.

Connection to prior HRVM implementation literature

Our VA implementation experience mirrors common themes described in recent HRVM literature. For example, prior HRVM implementation reports describing coordinated multisite rollouts similarly emphasize the importance of early planning and partner engagement, and attention to operational readiness, including technology, connectivity, and site-level workflow considerations.[40] Related implementation reports of vending-based naloxone distribution likewise emphasize feasibility and acceptability alongside practical workflow and maintenance considerations, reinforcing that operational dependencies (staffing, restocking processes, and troubleshooting pathways) are central to sustainment across settings.[41] More broadly, recent syntheses conclude that vending-based harm reduction approaches are promising but repeatedly highlight the importance of implementation planning, tailoring to context, and evaluation infrastructure, suggesting these domains represent cross-cutting priorities for future implementers rather than VA-specific challenges.[12]

Staffing and role delineation were foundational

Although initial launch was led by a CPP, sustainment required adding a dedicated technician to support

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product receiving, packaging, restocking, coil/tray adjustments, and day-to-day troubleshooting. This shared staffing model helped maintain continuity while allowing the CPP to focus on clinical leadership, product curation, stakeholder engagement, and program oversight.

Site readiness and installation required more time and contingency planning than anticipated

Placement decisions were shaped by physical constraints, connectivity needs for smart vending, and local concerns related to stigma, perceived risk, and media attention. These realities frequently necessitated alternate locations and delayed launches, reinforcing the importance of early measurement/site walkthroughs, documented network plans, and inspection of HRVMs at delivery to preserve warranty options. Future implementations may benefit from earlier, structured site readiness conversations with site leadership and frontline staff, including identifying local champions and explicitly eliciting stigma/NIMBY concerns, to inform placement decisions and communication plans before delivery.

On-demand, site-level assistance reduced access barriers

While barcode-based access supported anonymity and standardization, Veterans often needed on-demand help with sign-ups and HRVM use, particularly when phone access was limited. Training multidisciplinary POCs and providing ongoing consultation improved low-barrier access and created cross-coverage despite inevitable staff turnover.

Finally, data systems strengthened sustainment by linking utilization to operations

Web-based dispensing and inventory data supported proactive restocking, identification of high-demand products, iterative product packaging adjustments and product-mix updates over time, and evidence to inform budget projections and future funding requests. Together, these lessons suggest that HRVMs can be implemented successfully across clinical and supportive-housing settings when operational dependencies, including staffing, connectivity, and inventory workflows, are addressed early and monitored continuously.

Limitations and future directions

This practice report has limitations. First, we report implementation processes and program utilization using dispensing and sign-up data; we did not collect participant-level measures of substance use behaviors or risk profiles and therefore supply selection should not be interpreted as a direct proxy for individual risk. Second, product mix likely varies by site type and local context; a more granular analysis of standardized product categories by site and site type (eg, injection-related, smoking-related, overdose-prevention, safer sex, and basic-needs supplies) is planned in future evaluation work. Third, we did not include detailed cost accounting in this article; a forthcoming analysis led by our statistics/economics team will examine start-up and recurring operational costs, product costs, and utilization-standardized metrics (eg, cost/item dispensed, cost/machine-month) to inform planning and sustainment.

Implications for Policy & Practice

- Health systems considering HRVMs should plan for early, cross-sector partnerships (eg, pharmacy, housing, legal, privacy and security, information technology, contracting) because policy, procurement, and data-sharing requirements cut across multiple departments.
- Local policy scans and legal review are essential before adoption to address zoning, loitering, paraphernalia, and security concerns that can delay or block placement in community-based settings.
- Implementation in supportive housing showed that embedding HRVMs where people already live and receive services may increase access more than clinic-only deployment, but requires clear agreements on roles, liabilities, and restocking.
- Our experience suggests that centralized coordination with distributed champions (eg, site-level staff who monitor HRVMs and respond to issues) is a feasible model for multisite HRVM scale-up in large systems.
- Plan for sustainment from the outset by securing recurring funding for operations and ongoing product replenishment; braided funding may be necessary.
- To support evaluation and continuous QI, programs should build data infrastructure from the outset (eg, unique/anonymous IDs, standardized product categories, minimal required fields) that aligns with local privacy policies.
- Policymakers and health system leaders should view HRVMs as a complement—not a replacement—to staffed harm reduction services, and budget for ongoing staff time for outreach, linkage to care, and HRVM maintenance.

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Conclusions

A CPP-led, multisite deployment of 15 HRVMs across VHA clinics and supportive housing settings was feasible and acceptable, offering anonymous, low-barrier access to overdose prevention, sexual health, safer-use, and self-care supplies. Implementation required more than 20 months and sustained, cross-departmental coordination; dedicated staffing (CPP plus logistics technician), braided funding for products and operations, and standardized workflows (procurement/contracting, site-readiness checks for space and connectivity, inventory maintenance, communication plans to address stigma) were critical enablers. Distinct operating models emerged—business-hours access in clinics versus 24/7 access in supportive housing—allowing flexible alignment with site needs and security considerations.

These early lessons suggest that HRVMs can extend reach to Veterans who face barriers to traditional services and can complement existing harm reduction and linkage-to-care pathways. To accelerate scale and sustainment, health systems should pursue centralized or prevetted procurement pathways, shared implementation toolkits, and common data elements to streamline purchasing, installation, and evaluation. Future work should assess utilization patterns, equity of reach (including rural/underserved populations), clinical linkages (eg, HIV/STI screening, pre-/postexposure prophylaxis), safety outcomes, and cost-effectiveness. CPP-led HRVMs represent a pragmatic, scalable strategy to "meet Veterans where they are" and strengthen harm reduction infrastructure within and beyond the VHA.

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