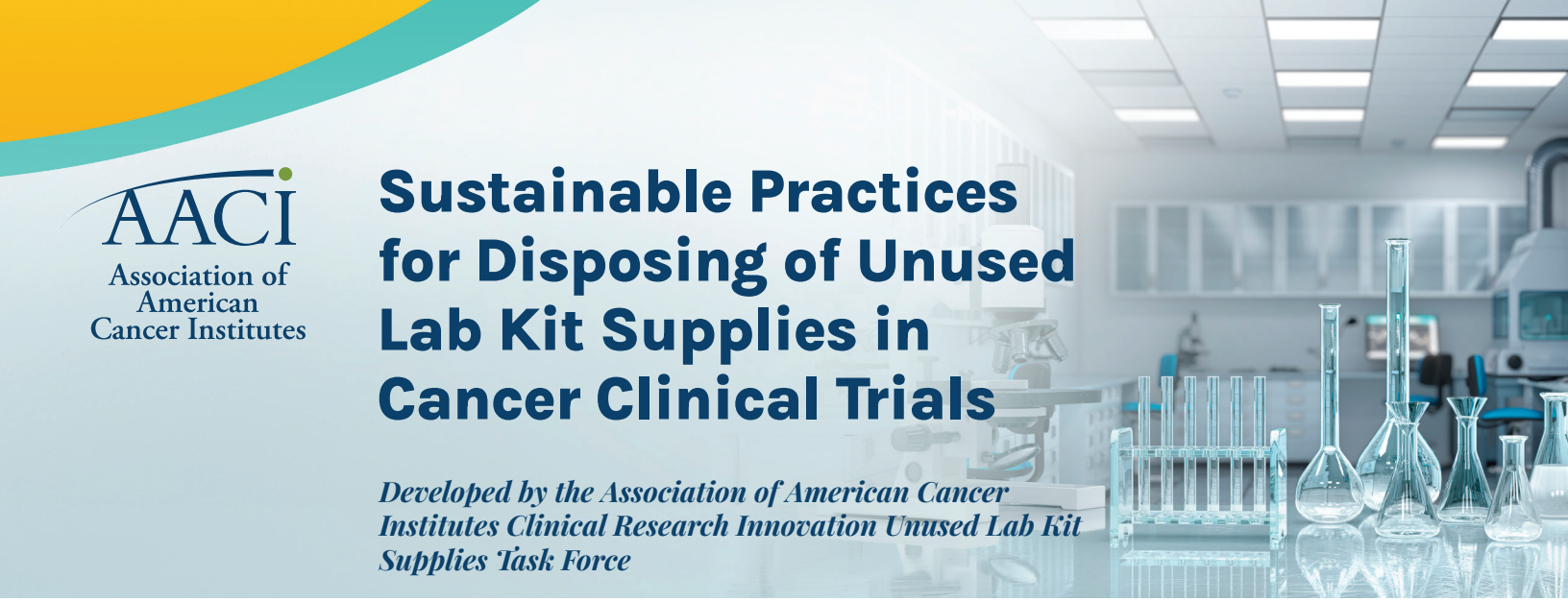


Sustainable Practices for Disposing of Unused Lab Kit Supplies in Cancer Clinical Trials

Developed by the Association of American Cancer Institutes Clinical Research Innovation Unused Lab Kit Supplies Task Force

THE CHALLENGE: LAB KIT WASTE IN CANCER CLINICAL TRIALS

Cancer clinical trials drive innovation and advance patient care, yet the increasingly complex operational processes that support them can generate a significant and often overlooked burden: waste[1]. Each year, millions of laboratory kits from industry-sponsored trials are produced to ensure protocol compliance and patient safety — yet up to 50 percent of trial laboratory kits go unused. The resulting environmental impact, overage and disposal costs, strain on storage capacity, and operational inefficiencies[2,3,4] are amplified by growing trial complexity, heightened environmental sustainability goals, and cost-savings pressures across research institutions[5,6,7].

The cumulative impacts on cancer center budgets, workflows, resources, and staffing are substantial. Institutional policies and available resources vary widely, making a one-size-fits-all approach unrealistic. Furthermore, study supply chains are often managed by trial sponsors, contract research organizations (CROs), central laboratories, and external vendors, leaving cancer centers with limited control over the quantity and composition of laboratory kits.

Members of the Association of American Cancer Institutes (AACI) Clinical Research Innovation (CRI) convened a task force representing cancer centers and research sites across the United States to examine current practices, limitations, and opportunities related to unused lab kits. The AACI CRI Unused Lab Kit Supplies Task Force developed practical frameworks to help sites approach data-informed conversations with study sponsors and explore sustainable practices that align with their existing infrastructure.

THE BIG MESS

Waste rates across sites were reported to be as high as 60 percent for trial-supplied materials. This excess often results in the destruction of insulated foam shippers and ambient gel packs, which ultimately end up in landfills, compounding environmental impact (*Fig. 1*). Short expiration dates on blood collection tubes and other kit components further limit opportunities for sustainable repurpose. Hidden disposal costs arise[1,8] from staff time required to break down the physical kits and the disposal of items requiring specialized and institution-specific destruction, including chemical waste from hazardous blood tube reagents, specimen-preserving chemicals such as ethanol and formalin, and needle devices classified as sharps (*Fig. 1*). These issues underscore the need for systemic changes in kit design, supply chain coordination, and sustainability practices. Trial sponsors must take an active role in optimizing supply quantities based on actual needs and projected accruals for each participating institution.

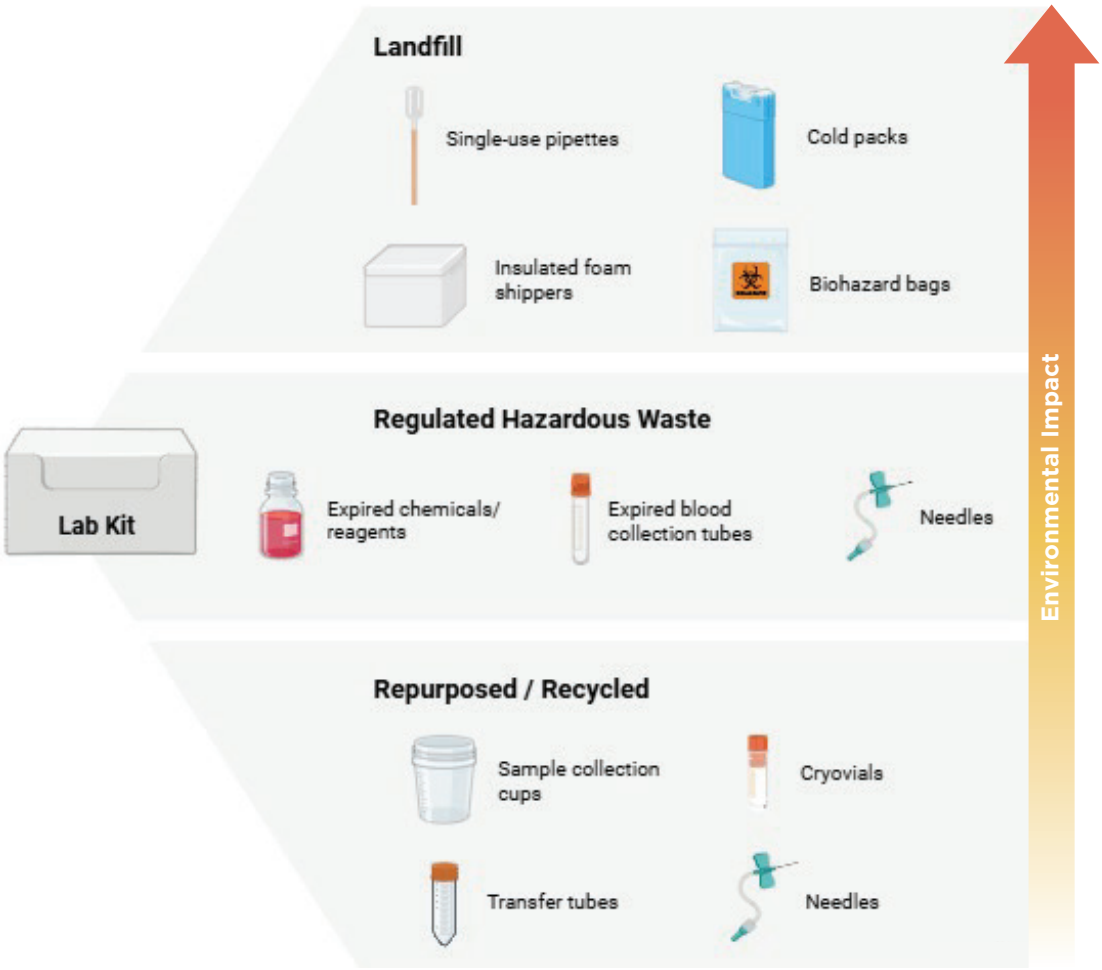


Figure 1: Lab kit components are dismantled into their common disposal mechanisms and associated environmental impact. Needles and sharps may be repurposed in some instances or disposed of as regulated sharps waste. Costs to institutions are associated with staff time and means of disposal.

MITIGATION STRATEGIES

Kit receipt at the site level is a continuous cycle of supply intake, use for trial time points, management of excess, and disposal (*Fig. 2*). Establishing waste reduction measures involves a multipronged strategy that includes repurposing, donating, and recycling supplies. Institution-based sustainability programs, such as hospital green initiatives, can serve as a practical first step. Additionally, partnering with local donation programs, professional schools (e.g. medical, nursing, veterinary), and other medical training organizations can help redirect several types of surplus materials for future training or clinical use. However, it is important that institutions consider the cost and staff time associated with these initiatives. Implementing and enforcing policies with sponsors and CROs ensures accountability for supply optimization, and annual reviews of lab kit inventory and disposal data create evidence to support sponsor-driven initiatives for minimizing waste. Policies should be flexible enough for sites to enforce, but rigorous enough to fit with the site standards.

Inventory tracking tools identify overstock and offer real-time insights into supply usage and expiration; however, successful adoption requires defined oversight, adequate staffing, training, and consistent maintenance. These foundational measures enable a systemic approach to reducing lab kit waste and improving trial efficiency by providing year over year, enterprise level insights that capture trends across sponsors and study areas.

Figure 2: Kit receipt level is a never-ending story of managing intake with usable inventory, disposal of expired or excess supplies, and disposal of supplies within the kits that aren't used at the site level.

CHANGE IMPACT AT THE SITE LEVEL

While data across all site types is typically low, several sites have begun to implement changes to attempt to control the influx of sponsor inventory. Several drivers are maintained within the site level of authority, and aggregating site data can influence a variety of measures (*Fig. 3*).

The task force identified several shared challenges contributing to unused lab kit waste across sites. Kit disposal volumes fluctuate across studies and sponsors, creating inconsistencies in how materials are handled and how space is allocated at the site. Breaking down and disposing of kits increases demands on staff time, adding to operational burden. Limited storage capacity further compounds these issues, while accumulated materials can create safety hazards and potentially impact site compliance with accreditation standards (e.g., The Joint Commission). Additionally, sites must navigate costs associated with managing and disposing of regulated components within the kits.

	Key Drivers	Authority
1	Communication Between Teams	Site Level Authority
	Inventory Tracking System	Site Level Authority
	Enforced Supply Policy	Site Level Authority
2	Internal Processing of New Lab Manuals	Site Level Influence
	Cost to Sponsor	Site Level Influence
	Reordering Estimations & Auto Supply	Site Level Influence
	Supply Donations	Site Level Influence
	Frequency of Supply & Biospecimen Shipments	Site Level Influence
3	Allotted Space for Trial Supply Storage	Externally Determined
	Central Lab Timelines for Lab Manuals & Designs	Externally Determined
	Courier Consistency	Externally Determined
	Kit Design & components	Externally Determined
	EDC & Kit Ordering Systems	Externally Determined

Figure 3: Authority Landscape for Clinical Trial Supply Drivers From Site Perspective

Authority that is externally determined speaks to factors established outside of the site-level trials office.

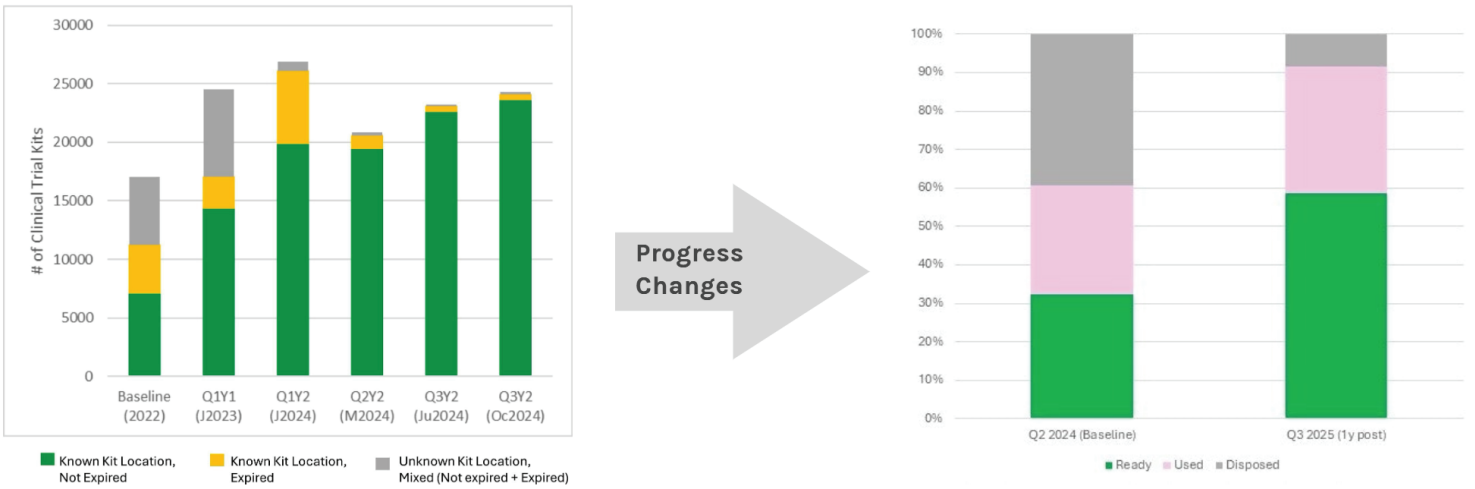
INDUSTRY INITIATIVES

In 2025, one vendor prioritized strategic sustainability. LabConnect partnered with Kits4Life to recover surplus and unused laboratory kits from clinical trials. Similar collaborations have the potential to divert significant waste from landfills and embed sustainability into clinical supply management. To elevate industry-wide awareness and set a new precedent for sustainable practices in clinical trials[9,10], they must become more widespread. Several consortiums have been developed to help bridge gaps between clinical sites, sponsors, and central labs, and vendor selection can be informed by sustainability ratings.

ACTION WITHIN REACH

The AACI CRI Unused Lab Kit Supplies Task Force offers the following use cases to help sites take modest, achievable steps toward broader institutional improvements.

By standardizing inventory tracking, the University of Arizona Cancer Center showed a reduction in laboratory kit-related deviations, while reporting allowed for supply predictions[11]. At UPMC Hillman Cancer Center, policy changes combined with inventory tracking resulted in a reduction in the number of kits disposed of on site by 79 percent over the first year of enforcement, with overall inventory remaining in a manageable, usable state over three years[1] (*Fig.* 4).



Kit management with Slope shows consistent progress with high volumes across department disease centers. Year over year review for all disease center items shows consistent inventory management progress as Slope was implemented across the 12 disease centers within UPMC Hillman Cancer Center main site. Quarters are defined as the start of the quarter, and years are defined as post-baseline implementation of Slope.

Policy changes decreased kits disposed of on site by a relative change of 79% over 1 year of enforcement.

Figure 4: Harmonized Data at the Site Level. New data from UPMC Hillman Cancer Center shows progress after consistent kit inventory tracking (left[1]) and policy enforcement (right).

Meaningful progress does not require sweeping changes upfront[12]. Institutions can achieve lasting improvements by taking small, deliberate steps; reviewing data; and tailoring their approach to fit their own institution, rather than aiming for an immediate organizational shift.

To support this approach, the AACI CRI Unused Lab Kit Task Force has divided action steps into Light Lifts and Heavy Lifts (*Fig. 5*). With data to support progress, sites can build momentum toward more substantial changes over time.

Light Lifts	Heavy Lifts
Create policy standards[A]	Track organizational inventory that allows destruction data generation across teams and sponsors
Donate within your local area[B]	Establish single point of entry for trial supplies where possible
Track disease center inventory	Develop internal plans for sustainability

Figure 5: The guidelines above outline small steps and more complex actions that can lead to decreased waste rates over time.

[A]*An effective policy would describe site responsibility for determining whether received supplies are excessive; establish standards for destruction; and define how supplies are accepted, tracked, monitored, and discarded throughout the study lifecycle at the organization or disease center level.*

[B]*Local re-use programs and animal care facilities (veterinarian, zoo) may accept unused site supplies.*

SPONSOR ENGAGEMENT: A SHARED RESPONSIBILITY

Industry sponsors are responsible for their trial design, and kit vendors oversee the assembly and distribution of supplies. Sites can support supply initiatives with periodic review of organizational disposal data to assist with evidence for sponsor- or vendor-led initiatives for waste reduction. Sponsors and vendors should assess clinical trial waste across studies to broadly identify opportunities to reduce unnecessary supply at multiple sites.

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