Digital Direct Procurement as a Quality and Efficiency Intervention in Allograft Tissue Utilization: Early Pilot Findings from Ambulatory Surgery Centers

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Background: Allograft tissue procurement in ambulatory surgery centers (ASCs) remains predominantly mediated through multi-vendor, representative-dependent distribution networks. Facilities commonly maintain separate purchasing relationships with several tissue suppliers, each with its own ordering workflow, contract terms, and documentation practices. This fragmentation distributes the procurement record across multiple systems and complicates lot-level traceability at the facility. It also leaves no mechanism by which unused supplier inventory approaching expiration can be matched to facility demand. Published evaluations of direct digital procurement in this setting are limited, and it is not established whether connecting ASCs in real time to AATB-accredited tissue banks can measurably reduce procurement cost or improve downstream traceability. This report describes the design and early outcomes of such a model over an initial six-month pilot period.

Methods: AlloDirect deployed a business-to-business digital procurement platform at two ambulatory surgery centers operated by a single orthopedic practice group in the Midwestern United States over a six-month period, replacing representative-mediated multi-vendor ordering with direct, real-time sourcing across five AATB-accredited tissue banks. At baseline, both sites procured allograft tissue predominantly through a regional distributor under a local purchasing contract. Order volume was concentrated at the higher-volume site. The platform aggregated over 24,000 active catalog items spanning structural bone, soft tissue, demineralized bone matrix (DBM), and acellular dermal matrix into a single searchable catalog with supplier-reported inventory visibility. Compliance features included lot-level and unique device identifier (UDI) documentation captured at the point of order and retained to support recall response. Expiration-date monitoring for stocking orders was implemented during the pilot and is undergoing iterative refinement. Outcomes assessed over six months included procurement cost relative to each site's own baseline, order-to-confirmation cycle time, vendor consolidation, and completeness of lot and UDI capture.

Results: At the six-month mark, observed procurement cost savings across the two sites totaled $92,345 against a comparable six-month baseline allograft spend of $550,000 (combined annual baseline $1.1 million), a 16.8% reduction, with the majority attributable to the higher-volume site. If order volume holds, the observed savings correspond to an annualized run rate of approximately $185,000. Savings were attributable to elimination of intermediary distribution fees rather than to any reduction in tissue bank service fees; participating tissue banks received their standard service fees throughout the pilot. Order confirmation cycle time was reduced from an average of 72 hours under legacy workflows to under 15 minutes. Both facilities consolidated from four tissue vendors to a single procurement point while maintaining surgeon graft preference coverage across all product categories in use. Lot-level and UDI documentation was captured on 100% of orders processed through the platform. Expiration

tracking for stocking orders demonstrated initial feasibility, with ongoing development focused on alert timing and workflow integration for supply managers.

Conclusions: Early pilot data suggest that direct digital procurement from AATB-accredited tissue banks may function as a meaningful quality and efficiency intervention in ASC allograft utilization. In this pilot the model reduced facility procurement cost, compressed order cycle times, consolidated vendor relationships, and captured lot-level and UDI documentation at the point of order. Because the observed savings derived from disintermediation rather than from any reduction in tissue bank service fees, the model may allow tissue banks to preserve their existing fee structures while gaining visibility into downstream utilization. Network effects inherent to the platform, in which each additional tissue bank and facility increases catalog breadth, fee transparency, and utilization data, may position this infrastructure as a scalable mechanism for reducing expired tissue waste. These findings derive from two sites within a single practice group over a limited period and are not generalizable. The magnitude of the observed reduction reflects the distributor-mediated baseline contract structure at these particular sites and should not be treated as an expected result across facilities with different baseline arrangements. A prospective study across multiple independent practice groups and tissue banks is warranted to validate these findings at scale.

Keywords: allograft procurement; digital supply chain; tissue waste reduction; traceability

Clinical Trial Registry: N/A

Data Deposition: N/A

Competing Interests: R. Barker is the founder, Chief Executive Officer, and an equity holder of AlloDirect, Inc., the company that developed and commercializes the procurement platform evaluated in this report. L. Cole provided data acquisition and analysis support under contract to AlloDirect, Inc. The authors designed the evaluation, had access to all underlying data, and prepared the manuscript. The reported outcomes were not audited by an independent third party.

Ethical Approval: Not applicable — this study did not involve human participants, their data, or biological material.

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PRACTICE, QUALITY, AND TRANSLATIONAL INNOVATION

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BACKGROUND

Allograft procurement in ambulatory surgery centers (ASCs) remains mediated through multi-vendor, representative-dependent distribution networks. Facilities commonly maintain separate relationships with several suppliers, each with its own ordering workflow and documentation practices, which fragments the procurement record and complicates lot-level traceability. Published evaluations of direct digital procurement in this setting are limited.

AT BASELINE · THE TWO PILOT SITES

$1.1M combined annual allograft spend across the two sites

4 tissue vendors per site, each with its own workflow and documentation

72 hrs average order-to-confirmation time under the legacy workflow

METHODS

Design

Six-month prospective operational pilot. Pre/post comparison against each site's own pre-intervention baseline.

Setting

Two ambulatory surgery centers operated by a single orthopedic practice group in the Midwestern United States. Order volume was concentrated at the higher-volume site.

Baseline

Both sites procured allograft tissue predominantly through a regional distributor under a local purchasing contract.

Intervention

Direct, real-time sourcing across five AATB-accredited tissue banks. Over 24,000 active catalog items spanning structural bone, soft tissue, demineralized bone matrix and acellular dermal matrix in one searchable catalog. Lot-level and unique device identifier (UDI) documentation captured at the point of order.

Outcomes

Procurement cost vs baseline; order-to-confirmation cycle time; vendor consolidation; completeness of lot and UDI capture.

RESULTS

16.8%

reduction in allograft procurement cost against a $550K comparable six-month baseline across the two sites (combined annual baseline $1.1M)

$92,345

observed savings over the six-month pilot, majority at the higher-volume site. Annualized run rate approximately $185,000 if volume holds

72 hrs > 15 min

order-to-confirmation cycle time, reduced from the legacy workflow average

4 > 1

tissue vendors per site, with surgeon graft preference coverage maintained across all categories in use

100%

of orders processed carried lot-level and UDI documentation captured at the point of order

Expiration tracking for stocking orders demonstrated initial feasibility. Development is ongoing on alert timing and workflow integration for supply managers.

CONCLUSIONS

Direct digital procurement from AATB-accredited tissue banks may function as a meaningful quality and efficiency intervention in ASC allograft utilization. In this pilot the model reduced procurement cost, compressed order cycle times, consolidated vendor relationships, and captured lot-level and UDI documentation at the point of order.

What this means for tissue banks

- Service fees preserved. Savings came from disintermediation, not from reducing what the bank receives.
- Downstream visibility. Direct transactions surface utilization data that distributor-mediated flow obscures.
- Utilization over expiration. Connecting supply to demand at the point of order is a lever on tissue that expires on the shelf.

NEXT STEPS

A prospective study across multiple independent practice groups and tissue banks is warranted to validate these findings at scale. The authors welcome collaboration with AATB-accredited institutions interested in participating.

LIMITATIONS

Two sites within a single practice group over six months. The savings figure is an observed six-month figure; the annualized run rate is an extrapolation, not realized annual results. The evaluation was designed and conducted by the platform developer and was not independently audited. The magnitude of the reduction reflects the distributor-mediated baseline contract structure at these particular sites and should not be treated as an expected result elsewhere.

Where the savings came from



Savings were attributable to elimination of intermediary distribution fees, not to any reduction in tissue bank service fees.

Participating tissue banks received their standard service fees throughout the pilot. The fee removed sat between the bank and the facility, and neither party had visibility into it.

Schematic. Proportions are illustrative, not measured values.

Disclosures: R. Barker is the founder, Chief Executive Officer, and an equity holder of AlloDirect, Inc., which developed and commercializes the platform evaluated here. L. Cole provided data acquisition and analysis support under contract to AlloDirect, Inc. Funded internally by AlloDirect, Inc. No external grants or funding were received. The reported outcomes were not audited by an independent third party.