AHRMM
Advancing Health Care through Supply Chain Excellence

AHRMM KPI ANALYSIS TOOL

AHRMM Keys

The AHRMM Keys for Supply Chain Excellence are **key performance indicators (KPIs) that set the standard for supply chain management** in the health care field. AHRMM Keys equip professionals with the information and supply chain metrics to measure performance over time, quantify the value of their organization's supply chain to executive leadership, and move their supply chain closer to operating from the intersection of Cost, Quality and Outcomes (CQO).

Explore Featured Keys for Supply Chain Excellence

Discover these highlighted key performance indicators and benchmark your performance against standards in the field. Each of the 12 AHRMM Keys in this document will help you to leverage invaluable insights into your operations and identify areas for improvement.

Finance

- Central Stores Inventory Turns
- Spend Under Management (SUM)
- Supply Accounts Payable (AP) Days
- Supply Chain Labor Expense Per Case Mix Index (CMI) Adjusted Discharge
- Supply Expense as % of Net Patient Revenue
- Supply Expense Per Case Mix Index (CMI) Adjusted Discharge

Operations

- Internal Requisition and Order Fill Percentage Rate
- Percentage of Items Stored in the Item Master with Identified Substitutes
- Percentage of Items Stored in the Item Master Populated with a GTIN
- Primary Distributor Fill Percentage Rate
- Recall Management – Closed Volume Percentage Rate
- Supply Chain FTEs Per $1M in Total Non-Labor Supply Expense

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Inventory Turns

Purpose:
Measures the hospital or health system's ability to manage its inventory of products to support the delivery of care.

Value:
Allows hospital executives and supply chain leaders to understand the organization's ability to order, store and deliver its products required for the delivery of care.

Equation:
Firstly, add the opening inventory dollars at the beginning of the month and closing inventory dollars at the end of the month, and divide this sum by two (2) – this will provide the '**Average inventory'**. To calculate the key, simply divide the **Total Inventory Supply Expense** by the average inventory.

(Opening inventory dollars at month start + closing inventory dollars at month end) ÷ 2 = **Average inventory**

Total inventory supply expense ÷ Average inventory = **Inventory turns**

Note: it is favorable to have a higher value for this Key. The higher the value the better.

Example:

- Total inventory supply expense = $550,000
- Opening inventory dollars balance = $600,000
- Closing inventory dollars balance = $400,000

$600,000 Opening inventory dollars balance + $400,000 Closing inventory dollars balance = $1,000,000

$1,000,000 ÷ 2 = **$500,000** Average inventory

$550,000 Total inventory supply expense ÷ $500,000 Average inventory = **1.1** monthly inventory turns

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Input Descriptions and Sources:

Input Name	Includes	Excludes
Total inventory supply expense	All medical and non-medical inventory supply expense. For medical, include expenses for Surgery, Cath Lab, EP Lab, Interventional Radiology and Interventional GI departments. For non-medical, include Office Supplies, Purchased Services, Facilities, Information Technology, Maintenance, etc.	All direct-ship/on-consignment expenses, purchased services, labor and labor-related expenses and services (salaries, bonuses), real estate, physician payments, capital, utilities, some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a print contract), taxes, reimbursements to individuals or contractors, insurance, bad debt, depreciation.
Opening inventory dollars	If your opening balances are recorded across multiple cost centers, sum all Opening Inventory Dollar amounts to arrive at this value. This value is for the month you are submitting data for, not a rolling 12 months period.	
Closing inventory dollars	If your closing balances are recorded across multiple cost centers, sum all Closing Inventory Dollar amounts to arrive at this value.	

Points of Clarification:

- This metric can be utilized to understand trends and performance over time to determine if the hospital or health system's strategies to increase or decrease turnover are yielding results.
- Typically, health care organizations calculate inventory turns by category or procedural areas to further target and identify areas of improvement. (e.g. the operating room or cardiac cath lab).
- Reporting by area provides a more advanced calculation of the hospital or health system's ability to manage its inventory of products.
- The audience should recognize that a lower metric may be justified in some instances; for example, lower turnover may be needed to ensure that sufficient clinical supplies and products are available to support delivery of patient care.
- Labor costs to support inventory management should be factored when determining value delivered through higher inventory turns metrics. For example, a hospital that is relying on additional staff to increase inventory turns may not be as efficient as one that is leveraging technology and automation to increase efficiency levels.
- In general, a higher metric suggests that the hospital is effectively managing its inventory by ordering and delivering the right amount of products to support patient care. Furthermore, a higher metric indicates that the hospital is ordering and turning over supplies at an optimal level, reducing unnecessary inventory and holding costs and improving overall profitability of the organization.
- However, hospital executives and supply chain leaders must also understand that maximizing inventory turns is not the desired outcome. Higher inventory turns must be balanced with the need to have enough products on hand to support patient care.

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Spend Under Management (SUM)

Purpose:
To provide leadership with a measure of the amount of total spend that is being effectively managed by the organization's supply chain team.

Value:
As the organization's spend under management increases, the ability to optimize costs and forecast expenses increases. Effectively managed spend gives the organization greater control over the risk of using inappropriate products/services. It prevents the risk of having contracts in place that are in legal conflict with each other. SUM also identifies "maverick" spend in the organization.

Equation:
Firstly, sum Total Supply Expense and Total purchased services expense to arrive at your '**Total supply and purchased services expense'**. To calculate SUM, divide **spend actively sourced/managed by supply chain** by this 'Total supply and purchased services expense', and multiple the result by 100.

(Spend actively sourced/managed by supply chain ÷ Total supply and purchased services expense) × 100 = SUM percentage

Note: it is favorable to have a higher value for this Key. The higher the value the better.

Example:

- Total spend actively sourced/managed by supply chain: $600,000,000
- Total supply expense: $750,000,000
- Total purchased services expense: $250,000,000

$600,000,000 ÷ $1,000,000,000 = 0.60 × 100 = **60% SUM percentage**

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Input Descriptions and Sources:

Input Name	Includes	Excludes
Total supply expense	All medical, non-medical, inventory and direct-ship/on-consignment supply expense. For medical, include expenses for Surgery, Cath Lab, EP Lab, Interventional Radiology and Interventional GI departments. For non-medical, include Office Supplies, Purchased Services, Facilities, Information Technology, Maintenance, etc. For consignment expenses, include freight, standard distribution costs and sales-and-use tax (minus rebates). Refer to AHRMM/HFMA supply categories for further details.	Purchased services, labor and labor-related expenses and services (salaries, bonuses), real estate, physician payments, capital, utilities, some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a print contract), taxes, reimbursements to individuals or contractors, insurance, bad debt, depreciation.
Total purchased services expense	All Purchased Services expenses (clinical and non-clinical). This is inclusive of Pharmacy, Lab, Construction, Research, IT, Purchase Services (Food, EVS, Clinical Engineering), Radiology, Facilities, and Maintenance.	Taxes, Salaries and bonuses, Charitable contributions, Dividends, securities, interest payments, Stock repurchases, Organizational memberships.
Spend actively sourced/managed by supply chain	Spend actively sourced/managed by supply chain professionals refers to spend that the supply chain organization led and/or was involved in the process of supplier selection, product evaluations, pricing, etc. This is inclusive of Pharmacy, Lab, Construction, Research, IT, Purchase Services (Food, EVS, Clinical Engineering), Radiology, Facilities, and Maintenance.	Everything not actively sourced/managed by supply chain.

Points of Clarification:

Data usually comes from multiple sources. It is extremely important to ensure that all sources are included. The main sources of data are the organization's accounts payable (AP) system, which may be a module within an enterprise resource planning (ERP) system, and a purchasing card (p-card) system. If payments are made to third parties other than through the AP or p-card systems (e.g. voucher system, direct pay system, or travel and expense system), they should also be included.

If available, a health care organization may find the following systems useful in determining its overall, non-payroll, influenceable and managed spend because they include additional information about the organization's financial transactions:

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- E-procurement systems: For many organizations, spend managed by an e-procurement system has gone through an approval process and/or through a catalog (whether hosted or punch-out) and is more likely to be managed spend than other methods of buying.
- Contract management systems: These systems can provide information on which vendors and goods have a contract in place and are therefore likely to be influenceable or managed spend.
- Vendor management systems: They contain additional information about the vendors to help determine which transactions are influenceable and which are not.
- The intent is "sourceable" spend not just "sourced" spend by supply chain professionals. Expenditures on taxes, employee base salaries and bonuses, charitable contributions, organizational memberships, dividends, securities, interest payments and stock repurchases should be excluded from the spend amount.
- Spend actively sourced/managed by procurement professionals refers to spend that the supply chain organization led and/or was involved in the process of supplier selection and pricing. This includes Pharmacy, Lab, Construction, Research, IT, Purchase Services (Food, EVS, Clinical Engineering).
- Spend under management is not equal to identified or realized savings.
- Spend management of 100 percent is not necessarily attainable or desirable.

Generally accepted accounting principles (GAAP) for health care providers calls for supplies and purchased services as separate expense lines on the income statement. While much of this expense may not be the spend sourced by procurement, it should be the goal of the professional to capture this spend and include it in the denominator of this KPI.

References:

Some content adapted from the following:

- Analyze This: Procurement Metrics That Matter, SIG Global Executive Summit, 2014
- Spend Under Management, Institute for Supply Management (ISM)
- What Is ‘Spend’?—Defining Spend in the Procurement Process, American City & County, July 2013
- Your Definition of Spend Under Management Is Wrong
- “Spend Under Management?” Odds Are You’re Doing It Wrong

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Supply Accounts Payable (AP) Days

Purpose:
Measures how effectively the health care organization is managing its payables.

Value:
May be utilized to ensure discounts are optimized, as well as provide greater insight into payment trends and cash flow fluctuations.

Equation:
Firstly, add the opening AP dollars at the beginning of the month and closing AP dollars at the end of the month, and divide the sum by two (2) – this will provide the '**AP average**'. Next, divide the '**Total supply expense**' by the 'AP average' to calculate the '**AP turns**'. Lastly, divide 30.4 days (average day count for a month) by the 'AP turns' to calculate the **AP Days**

(Opening AP dollars at month start + closing AP dollars at month end) ÷ 2 = **AP average**
Total supply expense ÷ AP average = **AP turns**
30.4 ÷ AP turns = **AP Days**

Note: it is favorable to have a lower value for this Key. The lower the value the better. An increase in AP days over time may indicate a worsening financial condition.

Example:
The system controller for Sergeant's Health would like to determine the AP days for the last month. The opening AP balance was $700,000 and the closing balance was $774,000. Total supply expense for the past month was $550,000. The AP days are calculated as:

Opening AP dollars $700,000 + closing AP dollars $774,000 = $1,474,000 ÷ 2 = **$737,000** AP average
Total supply expense $550,000 ÷ $737,000 = **0.75** AP turns
30.4 (days) ÷ 0.75 AP turns = **41** AP Days

Input Descriptions and Sources:

Input Name	Includes	Excludes
Total supply expense	All medical, non-medical, inventory and direct-ship/on-consignment supply expense. For medical, include expenses for Surgery, Cath Lab, EP Lab, Interventional Radiology and Interventional GI departments. For non-medical, include Office Supplies, Purchased Services, Facilities, Information Technology, Maintenance, etc. For consignment expenses, include freight, standard distribution costs and sales-and-use tax (minus rebates). Refer to AHRMM/HFMA supply categories for further details.	Purchased services, labor and labor-related expenses and services (salaries, bonuses), real estate, physician payments, capital, utilities, some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a print contract), taxes, reimbursements to individuals or contractors, insurance, bad debt, depreciation.

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Opening AP dollars	The opening value for your Accounts Payable (AP) dollars at the start of a given month.	
Closing AP dollars	The closing value for your Accounts Payable (AP) dollars at the end of a given month.	

Points of Clarification:

- An organization's stance on making partial payments will influence this metric.

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Supply Chain Labor Expense Per Case Mix Index (CMI) Adjusted Discharge

Purpose:

This KPI defines the labor cost per discharge for in-house supply chain functions. This unit cost informs the sustainability of supply chain's cost structure within an organization.

Value:

Tracking this labor cost per discharge informs if changes in patient activity are impacting supply chain labor costs.

Equation:

Use if you have the Number of CMI Adjusted Discharges available:

Simply divide your **Total labor expense** by **Number of CMI Adjusted Discharges**.

Total labor expense ÷ Number of CMI Adjusted Discharges = **Supply chain labor expense per CMI adjusted discharge**

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:

Source data, a hospital that has:

- Total labor expense: $500,000
- Number of CMI Adjusted Discharges: 96,000

$500,000 Total Labor Expense
÷
96,000 Number of CMI Adjusted Discharges
=
$5.21 Supply chain labor expense per CMI adjusted discharge

Equation:

Use if you don't have the Number of CMI Adjusted Discharges available:

Firstly, divide your Gross outpatient revenue by your Gross inpatient revenue to derive your '**Adjustment'**. Next, multiply this 'Adjustment' by the Number of inpatient discharges to derive your '**Adjusted discharges'**. Then, multiply the 'Adjusted discharges' by the Case Mix Index (CMI) to derive '**Number of CMI Adjusted**

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Discharges'. Lastly, simply divide the total labor expense by the Number of CMI Adjusted Discharges to calculate the Key.

Gross outpatient revenue / Gross inpatient revenue = **Adjustment**
Adjustment x Number of inpatient discharges = **Adjusted discharges**
Adjusted discharges x CMI = **Number of CMI Adjusted Discharges**
Total labor expense ÷ Number of CMI Adjusted Discharges = **Supply chain labor expense per CMI adjusted discharge**

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:

Source data, a hospital that has:

- Total labor expense: $500,000
- Gross inpatient revenue: $10,000,000
- Gross outpatient revenue: $8,000,000
- Inpatient discharges: 60,000
- CMI: 2.0

Gross outpatient revenue $8,000,000 / Gross inpatient revenue $10,000,000 = **0.8** Adjustment
0.8 x Number of inpatient discharges 60,000= **48,000** adjusted discharges
48,000 x CMI of 2.0 = **96,000** CMI Adjusted Discharges
Total labor expense $500,000 ÷ 96,000 = **$5.21** Supply chain labor expense per CMI adjusted discharge

Input Descriptions and Sources:

Input Name	Includes	Excludes
Gross outpatient revenue	All gross outpatient Revenue such as Medicare, Commercial Insurance or self-pay that includes all deductibles such as Adjustments, Reimbursements, Rebates, etc. Refer to AHRMM/HFMA supply categories for further details.	Contractual allowances, Charity care, Bad debt, Labor-related expenses and services, Some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a copier contract), Purchased services
Gross inpatient revenue	All gross inpatient Revenue such as Medicare, Commercial Insurance or self-pay that includes all deductibles such as Adjustments, Reimbursements, Rebates, etc. Refer to AHRMM/HFMA supply categories for further details.	
Number of inpatient discharges	This is the total inpatient discharges for the month.	
Case Mix Index (CMI)	Case Mix Index (CMI) is a standardized formula that is driven by diagnostic related group (DRG)	

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	mix of inpatients. Input the index here.	
Number of Case Mix Index (CMI) adjusted discharges	The total inpatient discharges for the month, adjusted with the Case Mix Index (CMI).	
Total labor expense	Total salary expense and benefits cost for all personnel in departments or cost centers that roll up or report to the supply chain function at a hospital or health care system.	Non-labor operational costs driven by supply chain management functions.

Points of Clarification:

- If the health care organization's supply chain organization utilizes full time equivalents (FTE) that perform supply chain related tasks and functions but report to other, non-supply chain cost centers, it should consider capturing and including the cost of these "shadow FTEs" in the Total labor expense part of this metric's equation.

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Supply Expense as Percent of Net Patient Revenue

Purpose:
This Key is a high-level metric that monitors the relationship between supply expense and net patient revenue.

Value:
Changes to this metric may indicate a shift in the relationship between supply expense and the associated net patient revenue. If the change is a trend (versus single point of variation), it should trigger an evaluation of the root cause and the development of an action plan. Causes can range from increased supply cost or increased supply utilization, to changes in the patient and/or payor mix that effect net revenue.

Equation:
Total Supply Expense ÷ Net Patient Revenue = **Supply Expense as % of Net Patient Revenue**

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:
Source data, a hospital that has:

- Total supply expense: $1,000,000
- Net inpatient revenue: $3,800,000
- Net outpatient revenue: $2,200,000

Net inpatient revenue $3,800,000 + Net outpatient revenue $2,200,000 = **Net patient revenue of $6,000,000**

$1,000,000 Total Supply Expense
÷
$6,000,000 Net Patient Revenue
=
16.67% Supply Expense as % of Net Patient Revenue

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Input Descriptions and Sources:

Input Name	Includes	Excludes
Net patient revenue	All inpatient and outpatient revenue such as Medicare, Commercial Insurance or self-pay.	All deductibles such as Adjustments, Reimbursements, Rebates, etc.
Total supply expense	All medical, non-medical, inventory and direct-ship/on-consignment supply expense. For medical, include expenses for Surgery, Cath Lab, EP Lab, Interventional Radiology and Interventional GI departments. For non-medical, include Office Supplies, Purchased Services, Facilities, Information Technology, Maintenance, etc. For consignment expenses, include freight, standard distribution costs and sales-and-use tax (minus rebates). Refer to AHRMM/HFMA supply categories for further details.	Purchased services, labor and labor-related expenses and services (salaries, bonuses), real estate, physician payments, capital, utilities, some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a print contract), taxes, reimbursements to individuals or contractors, insurance, bad debt, depreciation.

Points of Clarification:

- Changes to this metric may be caused by both supply expense and net revenue shifts. Therefore, a root cause analysis must be completed prior to developing action plans. For example, if revenue reporting is favorable, this KPI may cause the health system to underestimate the potential of supply expense savings opportunities. The opposite is also true, if revenue reporting is unfavorable, supply expense saving opportunities may be overestimated.
- Should there be a fluctuation in supply expense as a percentage of net patient revenue, it may indicate a change in supply consumption or utilization behavior (e.g. adoption of new supplies, emerging or disrupting technologies, change in practice variation, pricing, etc.) with no corresponding increase in patient revenue.
- If using this metric for benchmarking keep in mind it does not take into account regional and national differences in reimbursement rates.

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Supply Expense Per Case Mix Index (CMI) Adjusted Discharge

Purpose:
May be used to measure supply expense on a volume basis. Case mix index (CMI) adjusts to account for patient acuity.

Value:
Enables the organization to measure and trend supply expense that is adjusted for volume and patient acuity.

Equation:
Use if you **have** the Number of CMI Adjusted Discharges available:

Total supply expense ÷ Number of CMI Adjusted Discharges = **Supply expense per CMI adjusted discharge**

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:

Source data, a hospital that has:

- Total supply expense: $1,000,000
- Number of CMI Adjusted Discharges: 96,000

$1,000,000 Total Supply Expense
÷
96,000 Number of CMI Adjusted Discharges
=
$10.42 Supply expense per CMI adjusted discharge

Equation:
Use if you **don't have** the Number of CMI Adjusted Discharges available:

See the previous equation on how to obtain the '**Total supply expense'**. Next, divide your Gross outpatient revenue by your Gross inpatient revenue to derive your '**Adjustment'**. Next, multiply this 'Adjustment' by the Number of inpatient discharges to derive your '**Adjusted discharges'**. Then, multiply the 'Adjusted discharges' by the Case Mix Index (CMI) to derive '**Number of CMI Adjusted Discharges'**. Lastly, simply divide the total supply expense by the Number of CMI Adjusted Discharges to calculate the Key.

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Gross outpatient revenue / Gross inpatient revenue = **Adjustment**
Adjustment x Number of inpatient discharges = **Adjusted discharges**
Adjusted discharges x CMI = **Number of CMI Adjusted Discharges**
Total supply expense ÷ Number of CMI Adjusted Discharges = **Supply expense per CMI adjusted discharge**

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:

Source data, a hospital that has:

- Total supply expense: $1,000,000
- Gross inpatient revenue: $10,000,000
- Gross outpatient revenue: $8,000,000
- Inpatient discharges: 60,000
- CMI: 2.0

Gross outpatient revenue $8,000,000 / Gross inpatient revenue $10,000,000 = **0.8** Adjustment
0.8 x Number of inpatient discharges 60,000= **48,000** adjusted discharges
48,000 x CMI of 2.0 = **96,000** CMI Adjusted Discharges
Total supply expense $1,000,000 ÷ 96,000 = **$10.42** supply expense per CMI adjusted discharge

Input Descriptions and Sources:

Input Name	Includes	Excludes
Total supply expense	All medical, non-medical, inventory and direct-ship/on-consignment supply expense. For medical, include expenses for Surgery, Cath Lab, EP Lab, Interventional Radiology and Interventional GI departments. For non-medical, include Office Supplies, Purchased Services, Facilities, Information Technology, Maintenance, etc. For consignment expenses, include freight, standard distribution costs and sales-and-use tax (minus rebates). Refer to AHRMM/HFMA supply categories for further details.	Purchased services, labor and labor-related expenses and services (salaries, bonuses), real estate, physician payments, capital, utilities, some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a print contract), taxes, reimbursements to individuals or contractors, insurance, bad debt, depreciation.

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Gross outpatient revenue	All gross outpatient Revenue such as Medicare, Commercial Insurance or self-pay that includes all deductibles such as Adjustments, Reimbursements, Rebates, etc. Refer to AHRMM/HFMA supply categories for further details.	Contractual allowances, Charity care, Bad debt, Labor-related expenses and services, Some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a copier contract), Purchased services
Gross inpatient revenue	All gross inpatient Revenue such as Medicare, Commercial Insurance or self-pay that includes all deductibles such as Adjustments, Reimbursements, Rebates, etc. Refer to AHRMM/HFMA supply categories for further details.	
Number of inpatient discharges	This is the total inpatient discharges for the month.	
Case Mix Index (CMI)	Case Mix Index (CMI) is a standardized formula that is driven by diagnostic related group (DRG) mix of inpatients. Input the index here.	
Number of Case Mix Index (CMI) adjusted discharges	The total inpatient discharges for the month, adjusted with the Case Mix Index (CMI).	

Points of Clarification:

- The adjusted equivalent discharge calculation takes into account net inpatient revenue (which is measured as gross patient service revenue minus contractual allowances, charity care and bad debt) and outpatient revenue. The result of this formula allows outpatient activity to be factored into the volume statistic.
- CMI adjustment gives additional weight to the volume statistics for high acuity patients. CMI is a standardized formula that is driven by diagnostic related group (DRG) mix of inpatients.
- CMI index is not always reflective of the supply utilization patterns for hospitals with a high volume of complex, technology heavy surgical or interventional cases. They would benefit by calculating supply cost per surgical case or procedure in addition to supply cost per adjusted equivalent discharge.

References:

- Adjusted Discharges Supported

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Internal Requisition and Order Fill Percentage Rate

Purpose:
Measures the warehouse performance of order lines filled.

Value:
Enables a health care organization to monitor order fulfilment and identify opportunities to improve Inventory Management and build trust between the Supply Chain department and end users/clinical staff.

Equation:

Number of internal requisition order lines filled in full
÷
Total number of internal requisition lines ordered
=
Internal Requisition and Order Fill Percentage Rate

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:

- A hospital warehouse received a total of 2,000 order lines from all departments during the month.
- The warehouse was able to fill in full 1,850 of these order lines.

1,850 ÷ 2,000 = **92.5% Internal Requisition and Order Fill Percentage Rate**

Input Descriptions and Sources:

Input Name	Includes	Excludes
Total number of internal requisition lines ordered	All orders placed by a department via different methods to the warehouse (e.g. ParEx, Pyxis).	All orders placed by a department which are sent directly to the supplier
Number of internal requisition order lines filled in full	The number (count) of internal requisition order lines filled in full by the warehouse during the month.	Lines that are partially filled.

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Points of Clarification:

- Internal requisition and order fill percentage rate has a significant impact on Supply Chain's relationship with end users/clinical staff.
- This calculation is intended as a measure to monitor internal back order rates: Supply Chain's ability to fill internal requisitions/orders. In order to successfully calculate internal requisition and order fill percentage rate, the formula requires the number of orders that departments have placed and the number of orders that the warehouse could fill at first attempt. If the number of orders filled is not available, use the total order lines minus the total orders not filled.
- Supply Chain should aim for a fill rate between 93-98 percent. For order lines not filled three days in a row on a three-day inventory on-hand PAR, stockout will be inevitable.

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Percentage of Items Stored in the Item Master with Identified Substitutes

Purpose:
Measure the number of active items that have readily identified substitutes.

Value:
Enables the supply chain team to quickly and effectively identify what percentage of the organization's critical supply can be substituted with items that have already been vetted by stakeholders as clinically equivalent and meeting safety measures.

Equation:

Number of active items in the item master with identified substitutes
÷
Total number of active items in the item master
=
Percentage of Items Stored in the Item Master with Identified Substitutes

Note: it is favorable to have a higher value for this Key. The higher the value the better.

Example:

- A hospital's total number of active items in the item master is 7,500.
- The hospital's number of active items in the item master with identified substitutes is 100.

100 ÷ 7,500 = **1.3% Percentage of Items Stored in the Item Master with Identified Substitutes**

Input Descriptions and Sources:

Input Name	Includes	Excludes
Total number of active items in the item master	Total number of active items ONLY in the hospital's item master.	Inactive records contained within the item master; use your hospital or health system's definition of inactive records/items in your item master.
Number of active items in the item master with identified substitutes	Total number of active items ONLY in the hospital's item master with identified substitute products.	Proprietary items with no known substitutes.

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Points of Clarification:

- Readily identified substitutes must meet the clinical efficacy and quality levels of an original or preferred product.
- The data may be difficult to obtain depending on the health care organization's enterprise resource planning (ERP) system or materials management information system (MMIS), but it can be tailored to the capabilities or available data to meet the organization's needs.
- This equation is developed around items stored in general stores or the warehouse but can also be used for fast moving or items with a high focus, including such categories as personal protective equipment (PPE).
- The substitute product can be identical, slightly different but similar in use, or even an item that uses different methodologies at implementation. The identified substitute is defined as an item that meets the same intended purpose and goal as the original product.
    - **Example:** Custom kit. The identified substitute will most likely not be the identical kit as the original item but has been clinically approved to use if the original item cannot be obtained; or individual components that can meet the clinical need.
- Supplies can become backordered, discontinued or recalled at any time for a number of reasons: Low inventory levels, natural disasters, damage or an unprecedented increase in demand due to a pandemic. The true resiliency of a supply chain can be demonstrated by the ability of its team to plan, react and recover when these events occur.
- Understanding the items in the item master that have readily identified substitutes will enable that supply chain team to quickly and effectively procure items that have already been vetted by all stakeholders as clinically equivalent, meet the set safety measures and contractually build them in the system without further delays around committee/team approval, clinical trials and provider reviews.

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Percentage of Items Stored in the Item Master Populated with a Global Trade Identification Number (GTIN)

Purpose:

Measure a hospital or health system's level of adoption in populating active item master items with a Global Trade Identification Number (GTIN) identifier for use in supply chain transactions.

Value:

Enables the measurement of performance against preset GTIN adoption goals.

Equation:

Number of active items in the item master populated with a GTIN
÷
Total number of active items in the item master
=
Percentage of Items Stored in the Item Master Populated

Note: it is favorable to have a higher value for this Key. The higher the value the better.

Example:

- A hospital's number of item master items populated with a GTIN is 10,000.
- The hospital's total number of item master items is 100,000.

10,000 ÷ 100,000 = **10% Percentage of Items Stored in the Item Master Populated with a Global Trade Identification Number (GTIN)**

Input Descriptions and Sources:

Input Name	Includes	Excludes
Total number of active items in the item master	Total number of active items ONLY in the hospital's item master.	Inactive records contained within the item master; use your hospital or health system's definition of inactive records/items in your item master.
Number of active items in the item master populated with a GTIN	Total number of active items ONLY in the hospital's item master that have been populated with a GTIN (UDI-DI).	

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Points of Clarification:

- This metric can be utilized to understand trends and performance over time to determine if the hospital or health system's objectives to increase the use of GTINs are being realized.
- The adoption of data standards provides a method to codify in valid, meaningful, comprehensive and actionable ways, information captured in the course of doing business with all stakeholders within the health care supply chain.
- The GTIN is a globally unique GS1 identification number used to identify trade items, which includes both products and services that are sold, delivered and invoiced at any point in the supply chain. The elimination of customized or proprietary item identifiers can enhance the precision and velocity of supply chain transactions and recalls.

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Primary Distributor Fill Percentage Rate

Purpose:
Measure primary distributor fill rate, represented as a percentage of packages or stock-keeping units (SKU) successfully shipped on the first attempt.

Value:
Enables a health care organization to identity the effectiveness of order fulfilment by the primary distributor and set targets/goals with them.

Equation:

Number of PO lines filled on first attempt by your primary distributor
÷
Total number of PO lines submitted to your primary distributor
=
Primary Distributor Fill Percentage Rate

Note: it is favorable to have a higher value for this Key. The higher the value the better.

Example:

- A hospital's total PO lines for the primary distributor is 10,000.
- The number of PO lines the primary distributor is able to fill is 9,500.

9,500 ÷ 10,000 = **95% Primary Distributor Fill Percentage Rate**

Input Descriptions and Sources:

Input Name	Includes	Excludes
Total number of PO lines submitted to your primary distributor	If you have a "Fill or Kill" program set up with your primary distributor, please tabulate total PO Lines submitted to them this month. If you DO NOT have a "Fill or Kill" program set up, please tabulate total PO lines submitted to your primary distributor as required (e.g. daily, weekly basis).	POs to all suppliers which are not EDI capable.
Number of PO lines filled on first attempt by your primary distributor	If you have a "Fill or Kill" program set up with your primary distributor, how many PO lines were filled on first attempt this month? If you DO NOT have a "Fill or Kill" program set up, please tabulate total PO Lines filled on first attempt by your primary distributor as required (e.g. daily, weekly basis).	

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Recall Management – Closed Volume Percentage Rate

Purpose:

Measure the rate (as a percentage) at which a hospital/system has closed recalls received from the manufacturer and the U.S. Food and Drug Administration (FDA).

Value:

Allows hospitals/systems to assess their effectiveness in acknowledging and responding to recall product notifications. The implementation of such effective processes affects patient safety and care, and liability (both financial and risk) to the health care organization.

Equation:

Number of product recall alerts closed
÷
Total number of product recall alerts received
=
Closed Volume Percentage Rate

Note: it is favorable to have a higher value for this Key. The higher the value the better.

Example:

- A hospital's number of product recall alerts closed is 9.
- The hospital's total number of product recall alerts received is 10.

9 ÷ 10 = 90% Closed Volume Percentage Rate

Example Response Rates:

Percent of closed volume: Target 75 percent for Class III recalls, 90 percent for Class II recalls, 100 percent for Class I recalls.

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Input Descriptions and Sources:

Input Name	Includes	Excludes
Total number of product recall alerts received	The number of active recalls received for the month for products the facility has purchased, or currently has in-stock. These recalls could be notified by a third-party recall management system, or, mailed into the facility from sources including the FDA and manufacturers (Field notices, etc). Include recalls that are notified, and closed immediately because an item was not purchased, and if consignment or vendor "trunk stock", the product must be tracked through facility tracking processes. Only include the volume found within the facility, as well as implants that will have a record on the patient chart.	Product recalls received for products the facility does not have in stock.
Number of product recall alerts closed	The number of active recalls for the month for products the facility has purchased, or currently has in-stock that have been closed.	Recalls received for commodity products that may have been utilized before notification due to a lack of usage tracking.

Sources of Data for KPI Calculation:

- Third part recall management sources
- FDA class ranking
- MedWatch reporting site
- Internal hospital data sources, including but not limited to, materials management information system (MMIS), electronic medical record (EMR), point of use (POU) systems, and others that would serve as references against recall notifications

Points of Clarification:

- This Key assumes that an automated alert system and/or a centralized process exists within the health care organization. If your organization does not have either you should first establish a third-party alert/internal organizational process for recall management.
- This Key uses the FDA classification rankings for recall management (as follows); however, there are no federal mandates for recalls. AHRMM proposes these recommendations as guidelines for practice.
- Class I recall: A situation in which there is a reasonable probability that the use of or exposure to a violative product will cause serious adverse health consequences or death.
    - Example: A situation in which a catheter may kink or rupture during use leaving remnants behind in the patient that will cause serious injuries or death.

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- Class II recall: A situation in which use of or exposure to a violative product may cause temporary or medically reversible adverse health consequences or where the probability of serious adverse health consequences is remote.
    - Example: A package defect in which sterility has been compromised and could lead to contamination of the medical device and result in patient complications.
- Class III recall: A situation in which use of or exposure to a violative product is not likely to cause adverse health consequences.
    - Example: Labeling defect where the expiration date does not appear on the product label. A mislabeled package that contains one size of a particular medical device but is labeled as another size.
- By tracking the compliance rate, health care organizations can determine the effectiveness of their recall management processes and how to set best practices/notable practices towards better management.

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Supply Chain FTEs Per $1M in Total Non-Labor Supply Expense

Purpose:

Assess how many full-time equivalents (FTE) are needed to cover supply chain purchasing and contracting operations. FTE represents the number of working hours that one full-time employee completes during a fixed time period, such as one month or one year.

Value:

FTE converts workload hours into the number of people required to complete that work, which helps simplify scheduling. More importantly, it helps budget analysts and project managers estimate the cost of labor. Managers may also benefit from looking at FTE to determine if overtime costs are making it worthwhile to open up a new full-time or part-time position (Newman, par. 1).

Additionally, this KPI is helpful in budgeting FTEs and assessing supply chain labor costs related to non-labor supply expense. This, coupled with other supply chain KPIs, can help supply chain executives understand the efficiency of their purchasing and contract operations in relation to other hospital supply chain groups. It can also help executives broaden their perspective on the impact and influence of supply chain; by pegging FTEs to total non-labor supply expense, it enables executives to understand that supply chain has a role beyond traditional areas.

Equation:

Firstly, sum Total Supply Expense and Total Purchased Services Expense to arrive at your '**Total non-labor supply expense'**. Divide this value by 1 million to arrive at '**Total non-labor supply expense in millions'**. To calculate the Key, divide **Total number of supply chain FTEs** by this '**Total non-labor supply expense in millions'**.

Total supply and purchased services expense / 1,000,000 = **Total non-labor supply expense in millions**

Total number of supply chain FTEs ÷
Total non-labor supply expense in millions =
Supply Chain FTEs Per $1M in Total Non-Labor Supply Expense

Note: it is favorable to have a lower value for this Key. The lower the value the better.

Example:

A health system has $25,000,000 in total monthly non-labor supply expense and has 273 supply chain FTEs.

$25,000,000 ÷ 1,000,000 = **25** Total non-labor supply expense in millions
273 supply chain FTEs ÷ 25 = **10.92** Supply Chain FTEs Per $1M in Total Non-Labor Supply Expense

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Input Descriptions and Sources:

Input Name	Includes	Excludes
Total supply expense	All medical, non-medical, inventory and direct-ship/on-consignment supply expense. For medical, include expenses for Surgery, Cath Lab, EP Lab, Interventional Radiology and Interventional GI departments. For non-medical, include Office Supplies, Purchased Services, Facilities, Information Technology, Maintenance, etc. For consignment expenses, include freight, standard distribution costs and sales-and-use tax (minus rebates). Refer to AHRMM/HFMA supply categories for further details.	Purchased services, labor and labor-related expenses and services (salaries, bonuses), real estate, physician payments, capital, utilities, some tangible items that are frequently provided as part of service costs (e.g. toner that is part of a print contract), taxes, reimbursements to individuals or contractors, insurance, bad debt, depreciation.
Total purchased services expense	All Purchased Services expenses (clinical and non-clinical) such as Facilities, Information Technology, Maintenance, etc.	Taxes, Salaries and bonuses, Charitable contributions, Dividends, securities, interest payments, Stock repurchases, Organizational memberships.
Total number of supply chain Full Time Equivalents (FTEs)	List total number of FTE's in the supply chain department, whether employed full-time or part-time, with 1 "standard" FTE being based on a 40 hour working week. E.g. Someone working a 50 hour working week is 1.25 FTEs.	Anyone who is not employed by your organisation (e.g. the staff of vendors providing "purchased services")

Points of Clarification:

- Regarding calculating non-labor supply costs: Hospital finance departments have their total non-labor supply expense number readily available. These costs typically exclude insurance, bad debt and depreciation. Pharmaceuticals may or may not be included.
- Holiday hours and other paid leave (sick leave, maternity/paternity leave, etc.) are already accounted for as part of the hours worked, so special calculations for these hours are required.