Program Evaluation Using Pharmacist eCare Plan and Claims Data:

A Resource Guide

Authors:
Kim C. Coley, PharmD, FCCP
Sydney Salvati, PharmD
Stephanie McGrath, PharmD

Suggested Citation:
Coley KC, Salvati S, McGrath S.
Program Evaluation using Pharmacist eCare Plan and Claims Data:
A Resource Guide. University of Pittsburgh. 2026

University of Pittsburgh
Health Sciences
School of Pharmacy

Program Evaluation Using Pharmacist eCare Plan and Claims Data:

Authors:

Kim C. Coley, PharmD, FCCP
Professor of Pharmacy and Therapeutics
University of Pittsburgh School of Pharmacy
Pittsburgh, PA 15621

Sydney Salvati, PharmD
Community Leadership and Research Fellow
University of Pittsburgh School of Pharmacy
Pittsburgh, PA 15261

Stephanie McGrath, PharmD
Executive Director, Pennsylvania Pharmacists Care Network
Director of Community Partnerships
University of Pittsburgh School of Pharmacy
Pittsburgh, PA 15261

Acknowledgements

This guide was funded through a grant from the Community Pharmacy Foundation. The authors would like to acknowledge Alayne Gaghan, student pharmacist at the University of Pittsburgh School of Pharmacy, for her contributions to this work. Additionally, we would like to thank Lindsey Ludwig, RPh, Executive Director, CPESN Iowa and Dr. William Doucette, Professor of Pharmacy Practice and Science at the University of Iowa, for their thoughtful review of the guide.

Suggested Citation:

Coley KC, Salvati S, McGrath S.
Program Evaluation using Pharmacist eCare Plan and Claims Data:
A Resource Guide. University of Pittsburgh. 2026.

University of Pittsburgh | Health Sciences School of Pharmacy

Table of Contents

Section 1

Preface

Community pharmacists across the country have transformed their practice model to provide patient care services beyond dispensing medications. These services vary depending on the pharmacy, but may include medication adherence services, vaccinations, social determinants of health screening and referral services, and chronic disease state monitoring and management.[1-4] Participation in a clinically integrated network (CIN) is beneficial to leverage pharmacy services on a larger scale and to facilitate contracting and payment. CPESN USA is a national CIN representing over 3,500 community pharmacies across 45 states.[5] CPESN networks collaborate with local and national payors to establish contracts that reimburse community pharmacists for providing services. A guide was recently published as a resource for establishing relationships and contracts between pharmacy CINs and payors.[6] The establishment of these relationships is a foundational step in payor program implementation and evaluation.

Once payor programs are established, CPESN pharmacists utilize the Pharmacist eCare Plan (PeCP) to document patient care services. The PeCP uses Health Level Seven International (HL-7) as an interoperable transmission standard for pharmacists to capture medication-related concerns and goals, assessments, interventions, recommendations, and referrals.[7-8] Within the PeCP, pharmacists can select Systematized Nomenclature of Medicine- Clinical Terms (SNOMED-CT) codes to document the services provided during the patient encounter. [9] The documented SNOMED-CT codes can then be compiled using descriptive statistics to identify and analyze community pharmacist-provided enhanced services. While these descriptive evaluations demonstrate community pharmacists' ability to provide services, they do not effectively capture all important patient outcomes.[10-11]

The ability to demonstrate the impact of community pharmacist-provided services on patient outcomes is essential as healthcare delivery models transition from fee-for-service to value-based care. For community pharmacists to showcase their value to payors, it is also important to establish that their services improve quality metrics and/or health outcomes for patients.[12] Measures that can be utilized to assess pharmacist-provided services include medication adherence metrics, healthcare resource use (e.g. emergency department visits and hospitalizations), provider referrals, and clinical markers such as blood pressure control or hemoglobin A1c. Insurance claims data can be used to assess many, but not all of these outcomes. Since pharmacies and their CINs track the services they provide, establishing data-sharing partnerships with payors is a natural step toward more fully assessing patient outcomes. This guide serves as a roadmap for leveraging pharmacy CIN and payor partnerships to share data for more robust evaluations of community pharmacist-provided services. Individuals representing payors, academic institutions, and CINs can use this guide to facilitate this work.

Section 2

Identifying the Project Team

Acquiring and working with data from different sources (e.g. pharmacy claims data from a payor and PeCP data from CPESN USA) can be complicated, requiring a team of individuals with specific expertise. **Table 1** describes the types of individuals to consider as part of the project team. Some portions of these roles could be conducted by the same individual, depending on that person's skillset. For example, a data manager could also perform statistical analyses.

It is essential to identify an individual to serve as the project lead. This person will oversee the entire project including identifying team members and outlining their responsibilities. Ideally, this individual should have experience in managing complex projects with multiple partners. If working with data from a payor, identifying an individual from the payor partner to serve as a liaison with the project team will facilitate the data sharing process. This person should participate in regular meetings with the project team and be able to engage other key personnel at the payor organization. Since data security is an important aspect when two or more organizations share data, identifying data security experts at each partner organization is essential to facilitate data sharing. Bringing individuals with expertise in data management and analysis on the project team is also essential for success. This could be the project lead, a staff member, or another individual. Finally, additional consultants may be needed to complete specific tasks depending on the project and required skills.

Section 2 – Identifying the Project Team

Table 1. Proposed Project Team Members and Roles/Responsibilities	
Project Team Member	**Role/Responsibilities**
Project Lead	• Identifying potential partners, staff, and consultants • Defining project goals and scope • Drafting project protocol • Seeking funding for the work • Managing data agreements and contracts • Overseeing the conduct of the work and timelines • Problem solving • Disseminating project findings
Payor Partner Lead/Liason	• Work with payor administration for project approvals • Identify security and data management staff on payor side to support data use agreements, data extraction and data transfer • Facilitate communications between individuals on the payor side • Review project objective and protocol to achieve mutual goals • Meet with project team on a regular basis • Support dissemination of project findings
Data Security - all partners	• Support completion of data security agreements • Support secure data transfer
Data Manager - payor partner	• Extract and compile data sets • Develop a data dictionary • Work with Data Security to transfer data
Data Manager - payor partner	• Identify necessary data elements for project • Data management; coding
Statistician	• Inform statistical methodology • Perform statistical analyses
Project Staff	• Support team communications and meetings • Support all aspects of the project including project protocol development and data management • Help prepare project reports • Support dissemination of project findings

Section 3

Data Element and Flow

Project teams will first need to define the key entities and their roles for the project as described in **Section 2** of this guide. This includes identifying who will be involved with data sharing. Specifically, determine what entities will be sharing data and what data will be shared. It is best practice to only share the minimum necessary data elements needed to achieve the project objectives. **Table 2** provides a list of common data elements contained in PeCP and claims data that can be used in research. Entities providing data should also include a data dictionary for each data element being shared so that the meaning of the data is clear. The data dictionary should include the data element name, definition, and an explanation of codes used in the fields. For example, in administrative claims data provided by a payor, race may be coded with letters (e.g. W or B) or numbers (e.g. 1 or 2) and the dictionary must explain what each character represents. Similarly, the dictionary should specify which coding system is in use for fields that use industry standards. Commonly used coding systems include ICD-10-CM (Internal Classification of Diseases, 10th Revision, Clinical Modification) and CPT (Current Procedural Terminology).

A Data Request Form may be requested by the partner providing the data. This form is utilized to outline what data elements will be needed for the project. Completion of this request should be done in consultation with individuals familiar with the project design and data analysis.

A typical Data Request Form includes the following information:

- **Project objective.**
- **Project methodology including the timeframe for data extraction and the project outcome endpoints. Consider adding inclusion criteria that identify the patients of interest for the project.**
- **A list of each specific data element to be extracted. If using claims data, specify the type of claim (e.g. medical, pharmacy) that will serve as the source for each data element.**
- **Data analysis plan.**
- **If data will be combined from multiple sources, include a description of how the data will be linked.**

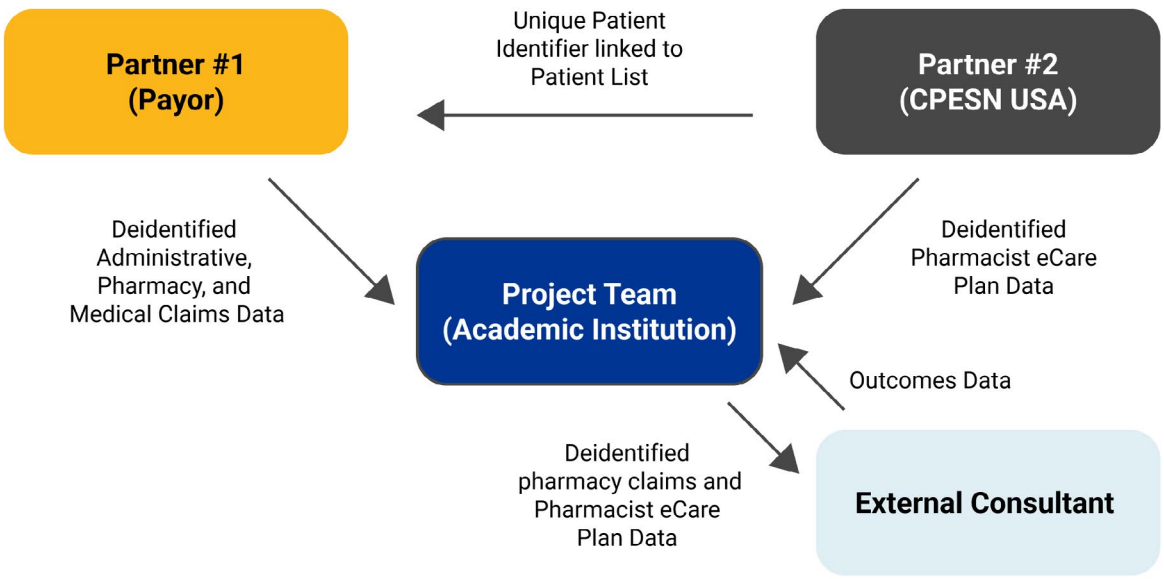
The ability to link patient data is key when analyzing data from different sources. PeCP data received from CPESN USA commonly contains a deidentified patient ID (i.e. CPESN Internal Patient ID), and this identifier can be used to link a patient across data sets. This will require an individual extracting and managing the other data (e.g. payor claims data) to recode patient identifiers with the CPESN Internal Patient ID.

Table 2: Common Data Elements in the PeCP and Claims Data	
PeCP Data Element Name	**Definition**
Internal Patient ID	Unique patient identifier assigned by CPESN USA
Pharmacy Name	Name of the pharmacy providing the service
Pharmacy NPI	10-digit national provider identification number
Vendor	Pharmacist PeCP technology platform
Author Name	Pharmacy team member submitting the eCare plan
Payor Code	Used to tie the eCare plan to a specific payor
Eligible for Payment	Denotes whether the service was payable
SNOMED-CT Code	Systemized Nomenclature of Medicine Clinical Terms (SNOMED-CT) Codes describes the service the pharmacy team provided
SNOMED Code Date	Service date
SNOMED Code Payment	Payment amount associated with the service
Administrative Claims Data Element Name	**Definition**
Patient Age	Patient age at the time of the encounter
Race	Patient race
Gender	Patient gender
Pharmacy Claims Data Element Name	**Definition**
Pharmacy NPI	Dispensing Pharmacy 10-digit national provider identification number
Prescriber NPI	10-digit national provider identification number
Product Service ID	11-digit National Drug Code
Service Date	Date of prescription fill
Product Service Name	Drug name of dispensed product
Generic Name	Generic drug name of dispensed product
Product Strength	Product Strength
Dosage form	Dosage form of drug
Quantity Dispensed	Quantity of product dispensed
Fill Number	Indicates whether the claim is for an original prescription or a subsequent refill
Days Supply	Estimated number of days the dispensed product will last
Refills Authorized Number	Number of refills authorized by the prescriber for dispensed product
Unit of Measure	Standard unit of measure for the dispensed product
Medical Claims Data Element Name	**Definition**
Claim ID	Unique number to identify the transaction record
Service start date	Date of service start
Service end date	Date of service end
Admission Date	Month, day, and year of admission for an inpatient
Discharge Date	Month, day, and year of discharge for an inpatient
Place of Service Code	2-digit code referencing where the service was rendered
Revenue Code	4-digit code describing where the service was rendered (e.g. laboratory, emergency room) or the type of accommodation) (e.g. semi-private room)
Service Code	J-Code/HCPCS (Healthcare Common Procedure Coding System) Code
Service Unit Quantity	Service quantity
Provider NPI	10-digit national provider identification number
Admission Diagnosis Code	ICD-10 code for working diagnosis on admission
Primary Diagnosis Code	ICD-10-CM code for diagnosis after patient evaluation
Diagnosis Codes (1-5)	Additional ICD-10-CM codes assigned to the encounter

Section 3 - Data Element and Flow

A Data Flow Diagram can be used to visualize the data sharing flow for the project and can be useful when working with different partners. This information may be requested by a partner as part of the legal and security documentation. Figure 1 is an example of a Data Flow Diagram which uses arrows to show how data will be shared in the project and the direction of data sharing. The arrows should be labeled with a brief description of the type of data being shared to make it clear to the audience. In some cases, there may be previous data sharing agreements already in place, so it is important to provide that background and call out any new data that will be shared because of the current project.

Figure 1: Example of Data Flow Diagram Between Project Team and Partners



Section 4

Legal and Security

Entities looking to share data will need to complete the proper legal and security documents. These may include a Vendor Risk Assessment (VRA) and a Data Use Agreement (DUA). When completing these documents, it is critical that all entities agree on their roles and responsibilities in the data sharing process. Additionally, project teams should anticipate that it may take months to get legal documents completed as they may need to go through the legal departments of all entities.

The VRA allows for the identification and assessment of potential vulnerabilities and threats to data security with third-party vendors. It is sometimes referred to as an Inherent Risk Assessment. Typically, the VRA is completed by the entity that will receive and house the data for management and analysis. For example, if a University partner is receiving payor claims data for analysis, the payor may require the University to complete a VRA. The VRA may require multiple people with different expertise for completion, so consider including both project personnel and data security personnel for this task. Table 3 lists some topic areas and example questions included in a VRA. Project team members may also need to complete additional security training (e.g. HIPAA for Research, Research Security Training) and document completion of those trainings.

Table 3. Vendor Risk Assessment Topics

Topic Area	Sample Questions
Security Policies	• Who is responsible for data security? • Do employees receive regular data security training?
Data Protection	• How is data securely stored? • Is data encrypted when transmitted? • Are firewalls and intrusion detection/prevention systems used? • How is access to data controlled?
Security Policies	• Who is responsible for data security? • Do employees receive regular data security training?
Physical Security	• What physical security measures are used to protect data in offices? • How is sensitive data securely disposed?
Data Content	• What type of data is being transferred? • Does the data include personal health information (PHI)? • How is data de-identified?
Third-Party Management	• Will any third-party have access to the data? • How is data security managed with subcontractors?

Section 4 - Legal and Security

A Data Use Agreement (DUA) is a document that allows entities to share a limited data set. A limited data set does not include most identifying information (e.g. patient names or date of birth) but can include dates of medication dispensing or healthcare services. More than one DUA may be necessary for a project if data will be shared across multiple entities. To begin the DUA process, the first step is to identify the entities sharing data and therefore requiring a DUA. The next step is to determine which entity should initiate the DUA process. Typically, the entity sharing their data is the initiator and responsible for drafting the DUA and sending it to the designated representative of the receiving entity. Table 4 lists some of the items commonly included in a DUA. The receiving entity will then review and complete the DUA before returning it to the initiating entity. Academic institutions typically require a DUA to be submitted to their contracts or legal office for review. This process will take additional time, so be sure to consider this in the project timeline. Expect the draft DUA to undergo several iterations before it is finalized.

Table 4. Data Use Agreement Items and Descriptions

Item	Description
Receiving entity information	Entity name and address.
Purpose of data sharing	Brief description of why the data is being shared (i.e. the project goal).
Confidentiality	Definition of the confidential information, the personnel bound to the agreement's terms, and the length of the confidentiality obligations.
Data being shared	Describes the data elements being shared between entities.
Permitted uses and disclosures	Outlines the acceptable uses of the data; who the data may be shared with and under what conditions; steps to take in the case of improper use of the data; and publication and other rights.
Term and termination	Length of time of the agreement and notices of termination.
Data security and safeguards	Describes how the data will be protected including access controls and secure storage.
Third party requirements	Information on the requirements necessary for data to be shared with third parties.
Data ownership	Statements regarding ownership of the data and intellectual property.

Section 5

Data Transfer

The study team should work with entities sharing data to develop a plan on how the data will be transferred. This information will also need to be included on the Vendor Risk Assessment. The receiving entity will be required to implement security safeguards (e.g. encryption, access control) and use a secure transfer method. The receiving entity may need to provide an IP address to the sharing entity for data access. Even if the data is deidentified, its transmission must be secured using a protocol that encrypts data in transit, such as a secure file transfer protocol (i.e. SFTP). It is recommended that each entity identify and utilize data security experts at their organization to ensure this process runs smoothly.

Other considerations when sharing and transferring data between entities include:

- **Provide names and credentials of users who will have access to the data.**
- **Agree on the format of the data file(s) (e.g. .csv or .txt) to ensure the receiving entity can work with the data.**
- **Be aware of the potential for large file sizes: Check server storage capacity and consider limitations of software used to manage the data. For example, a large medical claims file may exceed the row limit of Microsoft Excel.**
- **Plan to test the file transfer process early in the process to work out any problems that may arise.**
- **Review the data once it is received to determine if the transfer was successful, and all the required data elements are included.**

Section 6

Data Management and Analysis

Data collected and documented for clinical purposes such as PeCP data and pharmacy/medical claims data is considered secondary data. One of the most important things to remember when managing secondary data for program evaluation is that it was not originally collected for the purposes of research or analysis. As a result, it is best practice to develop a data management and analysis plan. The data management plan should include information on each of the data variables in the form of a data dictionary **(see Section 3)** and processes for data merging, cleaning and harmonization. This plan will also help minimize errors by ensuring that project team members apply the same rules for data manipulation. **Table 5** lists some of the common issues that arise with secondary data such as PeCP and claims data. Proposed solutions to these data issues are also provided.

It is important to always keep a copy of the original data in a safe and secure location. Keeping all data – including the original data and any subsequent data sets created through data management - securely stored is imperative. This process should be determined early on and outlined in the DUA and Vendor Risk Assessment. Additionally, if an error is made in the process of data management that cannot be corrected, the original data can be used to restart the process.

The data analysis plan will provide structure and transparency around how the formal analysis will be conducted. It would include what variables would be tested and which statistical tests will be applied to the data. When working with secondary data, it is easy to fall into the trap of data dredging. An example of data dredging would be evaluating combinations of variables for significance that were not related to the original project objective. A pre-defined data analysis plan will help prevent this pitfall.

Section 6 - Data Management and Analysis

Table 5. Common Issues with Secondary Data and Management Suggestions	
Data Issue	**Management**
Large file size	Check your data management program (e.g. Microsoft Excel, IBM SPSS) to determine the column and row limitations.
Original data format (e.g. .txt file) not ideal for analysis	If the data are structured with a consistent separator (e.g. space, comma, tab, or pipe), use a program like Microsoft Excel to import and convert "Text to Columns."
Extra data fields that are not necessary for the analysis	Consider removing unnecessary data fields so that the dataset is easier to visualize and work with. Other options are to filter, hide or move fields to the end of the dataset where they are beyond the viewable area.
Missing data	Management depends on many factors including the type of missing data and the goal of the analysis. Missing data can be excluded from the analysis, or a statistician can be consulted for other options.
Inconsistent data	Thoroughly review the dataset to identify inconsistencies/ discrepancies; Consult with experts on the data elements to inform decision-making; Clean data as appropriate.
Data recorded as text	When appropriate, recode text data to numeric data to facilitate analysis; Record the created numeric values and their text definitions.

Section 7

Dissemination

Once the project is complete, an important step is to disseminate the findings. Dissemination is the process of sharing project results with a broader audience. This can be done in various ways including publications, project reports, conference presentations, research posters, press releases, social media posts, and podcasts. Table 6 lists different considerations for the project team prior to starting the dissemination process. All project team members and partners should review and approve the content that will be shared prior to its dissemination.

Table 6: Considerations for the Dissemination Process

Dissemination Milestone	Questions to Address
Identify the essential information for sharing	• What are the main project takeaways? • How does this information add to the existing literature? • How will this information impact current practice?
Determine the target audience(s) for dissemination	• With whom do you want to share your project results? • Is the audience internal or external to the project team? • How should this information be framed for the target audience?
Identify the most effective way(s) for distribution of the project results	• How can the target audience be reached (e.g. conference, social media, journal publication, internal meetings)? • Can project partners help with dissemination or use their own communication channels? • Does the Data Use Agreement or project proposal/grant have any requirements for dissemination?
Determine how project partners will be represented in the dissemination process	• Will project materials and documents be co-branded? • How would the project partners like to be acknowledged on project dissemination materials?

References

1. Urick BY, Bhosle M, Farley JF. Patient Medication Adherence Among Pharmacies Participating in a North Carolina Enhanced Services Network. ***J Manag Care Spec Pharm.*** 2020;26(6):718-722. doi:10.18553/jmcp.2020.26.6.718

2. Johnson K, Kirby J, Kayse A, Brookhart A, Frede S, Hincapie A. Impact of an adherence intervention program on patient adherence and star ratings measures in a large community pharmacy chain. ***J Am Pharm Assoc (2003).*** 2020;60(4):e70-e78. doi:10.1016/j.japh.2020.02.017

3. Doucette WR, Alhersh E, Ludwig L, Veach S. Effects of a community pharmacy cardiovascular practice transformation (CPT) program on blood pressure. ***Explor Res Clin Soc Pharm.*** 2024;17:100559. Published 2024 Dec 25. doi:10.1016/j.rcsop.2024.100559

4. Al-Babtain B, Cheema E, Hadi MA. Impact of community-pharmacist-led medication review programmes on patient outcomes: A systematic review and meta-analysis of randomised controlled trials. ***Res Social Adm Pharm.*** 2022;18(4):2559-2568. doi:10.1016/j.sapharm.2021.04.022

5. CPESN. Available at: https://cpesn.com/ . Accessed October 3, 2025.

6. Daly CJ, Iqbal DN, Coley K, Doucette WR, Ferreri SP, Finke JB, Herbert S, McDonough RP, McGivney MS, Nuffer W, Smith MG, Bacci JL. Scaling Community Pharmacy and Payer Partnerships for Patient Care – A Resource Guide. Academia-Community Transformation Pharmacy Collaborative. Summer 2024.

7. Pharmacist eCare Plan Initiative. Available at: https://www.ecareplaninitiative.com/history-of-the-standard. Accessed October 15, 2025.

8. Pharmacist eCare Plan (Version 1.0). Guidance on the use of the HL7 CDA consolidated templates for clinical notes R2.1 care plan. Available at: Https://www.ncpdp.org/NCPDP/media/pdf/Pharmacist-eCare-Plan.pdf. Accessed October 15, 2025.

9. Spiro S. SNOMED CT is coming to pharmacy: A primer on systematized nomenclature of Medicine “clinical terms” documentation for pharmacist and pharmacy services. Pharmacy Times, 2016. Available at: https://www.pharmacytimes.com/view/snomed-ct-is-coming-to-pharmacy-a-primer-on-systematized-nomenclature-of-medicine-clinical-terms-documentation-for-pharmacist-and-pharmacy-services. Accessed September 9, 2025

10. Doucette WR, Bacci JL, Coley KC, et al. A taxonomy for community pharmacy patient care services reported in Pharmacist eCare Plans. ***J Am Pharm Assoc (2003).*** 2023;63(1):173-177. doi:10.1016/j.japh.2022.08.026

11. Snapp A, Gatewood SS, Kaefer TN, Nadpara P, Goode JR. A retrospective review of the impact of immunization eCare plans in community-based pharmacy setting. ***J Am Pharm Assoc (2003).*** 2024 Mar-Apr;64(2):577-581. doi: 10.1016/j.japh.2023.12.019. Epub 2023 Dec 25. PMID: 38151203.

12. Reis L, Gregório J. Professional pharmacy Services’ outcomes performance measurement: A narrative review. ***Explor Res Clin Soc Pharm.*** 2024 Oct 23;16:100533. doi: 10.1016/j.rcsop.2024.100533. PMID: 39555325; PMCID: PMC11563938.