Powering the Future of Healthcare

Clinical Data Acquisition Best Practices for Quality Improvement

CitiusTech

advent advisory group

Best practices for payers to manage rapid growth of clinical data:

Quality management has never been as important as it is today for health plans and providers alike. In addition to the impact on value-based contracts & payments, the impact on member satisfaction through improved outcomes alone can make or break payer growth strategies. Health plans and providers collaborate for mutual success through data sharing, investments in shared technologies & tools, and alignment of business models.

They also share clinical data for a variety of use cases such as pended claims, service authorizations, new member enrollment and underwriting analytics, risk adjustment (Medicare and Marketplace), and care management. This whitepaper aims to cover:

- Key drivers for rapid clinical data growth
- Clinical data acquisition & engagement best practices
- Key focus areas for payers to leverage clinical data

Quality Performance reporting is driving a shift towards higher quality and timely clinical data

Clinical data is generated at various touchpoints: Primary Care Provider (PCP) visits, lab tests, counselling sessions, health assessments, vaccinations, pharmacy dispensing, inpatient admissions, emergency or urgent care visits, telehealth encounters and electronic assessments, to name a few. The growth in demand for clinical data and its timely availability amongst payers is driven by multitude of factors:

Rapid shift in value-based arrangements[1] – Almost 75% of provider payments today are managed through value-based purchasing arrangements. Continuous improvement strategies under such arrangements include incentives and support for sharing high quality clinical data in a timely manner and are increasingly focused on patient outcomes rather than process compliance.

Richer clinical data with push for enhanced collaboration – Regulatory pressures from the Center for Medicare and Medicaid Services (CMS) programs such as Meaningful Use (MU), Merit-Based Incentive Payment System (MIPS), Promoting Interoperability and Office of the National Coordinator for Health IT (ONC) Interoperability & Patient Access rules have promoted documentation of clinical practice guidelines in structured data platforms at the site of care. Data sharing agreements continue to promote payer-provider clinical data coordination throughout the annual reporting cycle.

Regulatory bodies such as CMS and the National Committee for Quality Assurance (NCQA) are promoting the utilization of Fast Healthcare Interoperability Resources (FHIR) as the foundational standard for the infrastructure to exchange clinical data. FHIR will allow clinical data collaboration in a much more scalable, reliable, faster and cost-effective way, in a setting of enhanced collaboration and prohibited information blocking.

1- https://hitconsultant.net/2018/06/18/value-based-care-trends/#.YS3aQY4zbIU

Continuous evolution driving interoperability and data democratization – With clinical data being made available through regulations, several accelerator projects such as DaVinci, Sequoia, Argonaut, Gravity, SMART on FHIR, CARIN and others are underway to expand capabilities based on identified interoperability use cases and health system requirements. This promotes clinical data usage in enhancing care delivery across the member journey and increasing provider engagement. These efforts and resulting technological advances support the fundamental mission of promoting the Triple Aim (improved patient experience of care, health of populations, and reduced cost).

Electronic clinical data acquisition: Key design considerations for ingestion, storage, and use

Clinical data available to payers comes in a variety of formats. Accessing clinical data and enabling its effective use continues to be a challenge for all payer chief information officers (CIOs) and chief medical officers (CMOs). For example, although Consolidated Clinical Data Architecture (CCDA) contents are largely standardized, wide structural specification variations are common across EMR systems, vendors, and aggregators. Member-patient matching, metadata with provenance information and roster exchange continue to present challenges due to format variability. Therefore, specialized design considerations are required across the clinical data intake and engagement lifecycle for data validity, improved exchange, and usability in performance reporting.

Clinical data ingestion design considerations – HL7 feeds, CCDAs, supplemental data extracts and medical record images (PDF/TIFF/JPEG) are some of the most prevalent clinical data formats for payers today. The key for clinical data ingestion design is to allow for a wide range of supportive adaptors, which can ingest variety of formats along with the ability to validate variations from baseline source data model. It is important to have an adaptive strategy to ingest all type of data sources from relational to semi-structured, and unstructured data. The ability to consume clinical data through Application Programming Interface (API) calls is another growing trend with FHIR interoperability advancements, along with the advancements in EHR systems and availability of clinical data as real-time streams, thus, payers need provision for both batch and real-time processing. With rapidly growing daily clinical data volumes, parsed mirroring of sources for further processing enhances intake performance and decouples the complexity of file intake. Comprehensive and centralized data quality checks across clinical data sources can drive reliable business decisions downstream.

Data model and storage considerations for clinical data – While many payers currently have custom data models, regulatory changes are incenting more payers to investigate FHIR QI-Core and Observational Medical Outcomes Partnership (OMOP) as interoperable common data models (CDM). From a design standpoint, while raw source storage is driven by source format, operational data stores should be flexible for a variety of prevalent data models for clinical data storage. A key tenet for data design is the data quality enforcement during transformation. Multitenancy (i.e. storage isolation with ability to exercise physical and logical security controls) are important for the payers with de-centralized operations or for payers engaged with Administrative Services Only (ASO) relationships with other payers. Denormalized standard views of operational data store (ODS) or enterprise data warehouse (EDW) can cater to variety of payer downstream use cases such as quality, risk, care management, payment integrity and value-based contracts among others. Such standard views of centralized repository can significantly mitigate some overheads of managing custom data connections requiring raw storage in the setting of low data reliability. Ability to feed into advanced analytics sandboxes for various data driven experiments/predictive modeling and alignment with FHIR/interoperability requirements are two key design considerations.

Did You Know[2]

Health plans observed 90% growth in clinical data sources with physician clinics leading the race

Mid-size payers today (representing 1-5 million members) collect data from an average of 40-50 data sources for HEDIS® reporting, a notable increase over the past five years. Most of those sources are attributed to individual clinics and facilities with diverse electronic health records (EHRs).

2- Mutual and independent learnings from HEDIS MY2020 season for CitiusTech and Advent

Clinical Data Engagement: Source Validation

In the setting of increased data source prevalence and diversity, it is important to recognize that nuance is critical in determining what steps are needed to ensure the completeness, validity, integrity, consistency, and timeliness of data. No singular process or limited set of methods can be appropriately applied to every data set or in every circumstance of collection. As such, the suite of methods used for data quality assertion must be tailored to the well-defined characteristics of the collection project.

Requirements and Risk Assessment

Before collections and corresponding validations can be designed, the organization must assess the intent of the data and their expected characteristics. Questions to assess and address to promote a thorough risk assessment include:

- Is there data entry validation at the source?
- How are the data captured, stored, updated, collected, and aggregated?
- Are there other partners involved in the collection or delivery? If so, what ETL, processing steps or validations do they take responsibility for?
- Do you have metadata or logs regarding the target data set?
- What mapping has been done in collection?
- Is there a defined data model inherent to the raw data or desired output?
- Is the data inline operational or a retrospective collection?
- What are the expected standards for each attribute in terms of data type & valid values?
- How often does the collection deviate from these standards?
- What constitutes a critical deviation from the data's standards?
- How are exceptions handled and are exceptions remediated or dropped? Is exception handling monitored/logged?

A systematic assessment of these and many other factors throughout the collection project help to reveal the data risk profile and commensurate validation/verification activities. Characteristics that compose the data risk profile include, but may not be limited to, data entry validation, data capture/storage assessment, validation of all data transformations, metadata tags/logs of the target data set, data mapping, review data model of raw data storage along with frequency of data collection and what constitutes a critical deviation from the data's standards. The characteristics then help to determine the validation profile to be used in processing.

Some typical validation adjuncts include format verification, data typing, value norm trending, valid value limits, file size analysis/trending, load scheduling/ tracking, conditional attribute constraints, provenance assertion, source and/or destination deduplication, and primary source verification among many other options. Selection of techniques should be tailored to the collection project characteristics and risk profile. This process helps to iteratively establish source norms, limits, and expectations. Of course, many of these adjuncts can be implemented in ETL of real-time operational feeds to improve efficiency.

Program Design: Onboarding and Maintenance – Efficiency and accuracy are both critical to promoting a positive return on investment in any collection project, so experience can be used to dictate the frequency and timing of various validation adjuncts. Mature projects with established standards and experienced root-source operators may require nothing more than some highly automated technical validations. However, manually abstracted or machine-abstracted may require over-read or supervision respectively, which is typically characterized in the healthcare data domain as primary source verification (PSV). Typically, PSV is initially conducted during data onboarding and then may be repeated with system changes, new data, or for a periodic metareviews.

Experiences in PSV Review – Common error types include improper date label identification (e.g. order data vs. collection date vs. result/reported date), mapping errors, result formatting/units of measure, improper attribute selection, unstructured or semi-structured data in reportedly structured fields, inaccurate coding (e.g. improper or suboptimal code selection /mapping), failure to source proof-of-service evidence, missing place-of-service or provider information where it is required, events nullified by specimen inadequacy, and health histories represented as current diagnoses. Most of these errors are not identifiable by technical validations but can be remediated with technical solutions or with altered collection methods once identified in onboarding PSV.

Projected Evolution into Mature Systems – Many organizations assume that findings across any given vendor output will be relatively homogenous, but this is simply not true. The adage that, 'if you've seen one EHR, you've seen one EHR' rings true in repeated testing.

Implementation, data entry, workflow design, and clinical decision support schemas are implemented variably across and even within facilities for the same EHR, so each currently requires a distinct validation.

Interoperability requirements may eventually help to promote greater consistency in data modeling, and maturity in data exchange resulting in significantly reduced overall risk. However, despite FHIR's anticipated ability to promote consistent data exchange formatting and protocols, it does not assert many key elements of data quality. In fact, because it does promote consistent formatting, it may obfuscate many common data errors and promote a false sense of security. FHIR as the mechanism for interoperability may improve the accessibility and cost of clinical data in the near term, but data quality will follow from due diligence as the volume of transmission increases and each organization optimizes its feeds through sound data management principles.

Clinical data collaboration for the future: FHIR based intelligence and data exchange

While CCDA has inherent limitations such as being difficult to read, ingest, and manage, FHIR with its RESTful API structure enables seamless exchange of clinical data in a much more scalable, standardized and cost-effective manner. FHIR based clinical data exchange can enable near-real time alerts in both payer and provider workflows for prompt actioning and future intervention planning. Some of the key use cases include:

Care gap app using 'Smart on FHIR': Payer extended applications can be built using 'Smart on FHIR' which are directly integrated into the provider EHR. Providers can use such applications for tracking of patient open care gaps and associated gap expiry time sensitivity within the EHR workflow. Payer gap closure workflows can be configured to trigger workflow alerts and clinical data collection requests to the providers using point-to-point FHIR connectivity.

Driving time sensitive compliance using FHIR: FHIR based alerts can significantly improve actionability for time sensitive HEDIS® Stars Measures such as, Transitions of Care (TRC), Osteoporosis Management in Women Who Had a Fracture (OMW) and others. Daily or near real-time processing of FHIR encounter resources can promptly notify the payer of affiliated events for prompt actioning and wider intervention range, while eliminating weeks of notification delay.

Intelligent provider recommendations: FHIR based Clinical Decision Support (CDS) hooks can be leveraged for communicating other upcoming/pending clinical gap closures and also recommend preventive screenings within a provider workflow during the course of appointments. In fact, a CDS hook could trigger optimal evidence-based workflow immediately upon diagnosis at the point of care.

FHIR based clinical data collection: With significant technical enhancements underway, FHIR Bulk Data (commonly referred to as Flat FHIR) paves the way for payers to directly query into provider FHIR endpoints. This helps payers with clinical data collection at a significantly improved ROI and efficiency over current medical record chases with manual abstraction for various needs including risk adjustment, HEDIS, quality improvement activities, claims adjudication, fraud waste and abuse (FWA) detection or other purposes.

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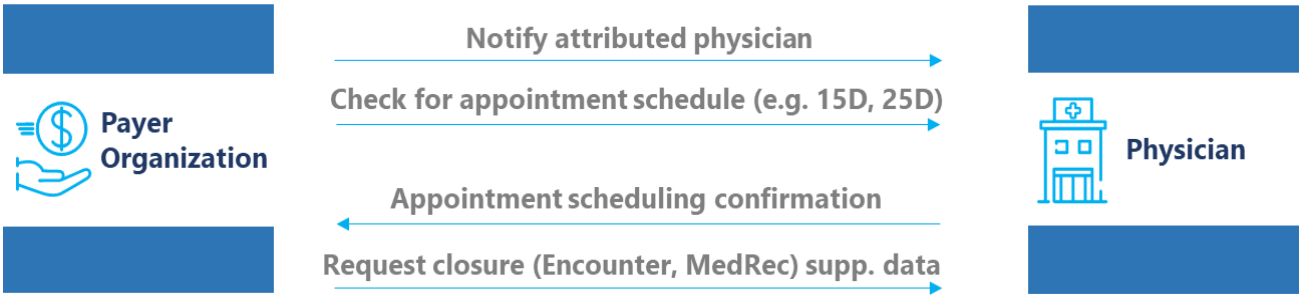
Quality improvement democratization enabled through FHIR exchange

*DaVinci initiative has successfully demonstrated several bi-directional **Data Exchange For Quality Measures (DEQM)** use cases such as **Gaps in care**, **MRP**, **COL***

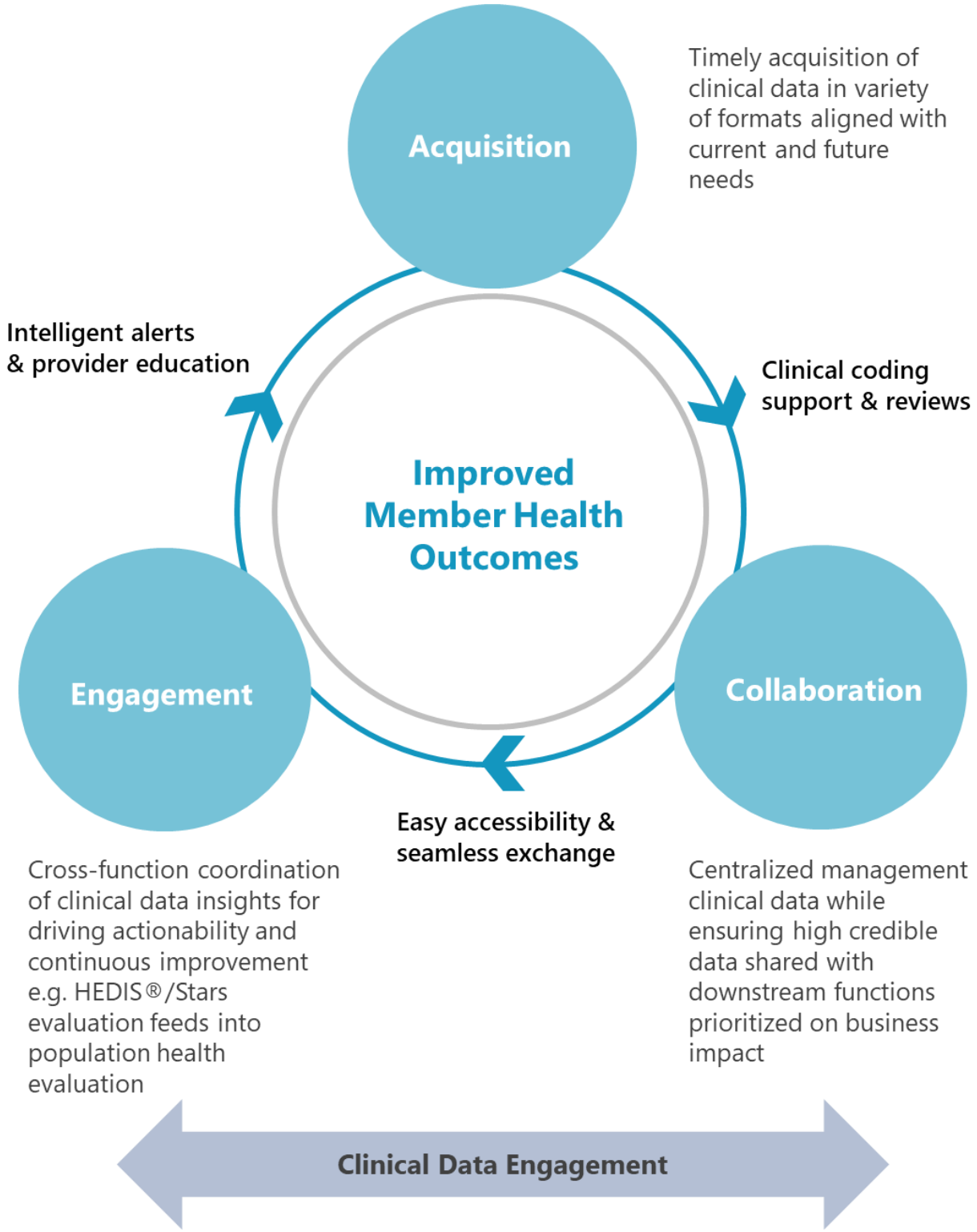
TRC3. TRC4: Proactively notify Physicians & drive gap closure through appointment scheduling within time window of gap expiry (30D)



Current State	Future State
Collection of supplemental data as HL7/CCDA/medical charts for risk/quality accounting	FHIR based encounter specific inquiry and clinical data retrieval for risk/quality
Sharing of periodic gap list (retrospective) with provider for action using either report/portal	Daily gap list sharing & immediate alerts using FHIR API into the provider system
2-3 weeks of provider turnaround on data requests	Within 24 hours turnaround on data requests (near real time)

Next Gen Quality Improvement calls for actionability through data democratization

Clinical data engagement: Across various payer cross-functions, data engagement is equally essential as timely acquisition of clinical data. Often the siloed enrichment of clinical data intelligence across various individual cross-functions is poorly coordinated and thereby prevents on-time actionability. Next Gen quality improvement demands a high degree of data collaboration in the payer-provider relationship and within the greater healthcare ecosystem.



Summary: Key Points for Consideration

Assess current level of maturity of clinical data strategy and engagement for a multi-phased transition plan – where are you seeing positive lift from clinical data and is it as expected? How reliable are data, and can you substantiate sufficient internal data validation?

Adopt holistic solution approach for clinical data acquisition and clinical data engagement – do you have sufficient coverage of your population & measures?

Prioritize business focus to optimize clinical data processing cycle, business turnaround needs and infrastructure spend – how long does it take for incoming clinical feeds to reflect in quality run outputs?

Include comprehensive audit provisions for clinical data authenticity through coordinated approach of technology and professional services – how seamless is your audit experience?

Evaluate data source impact upfront to have alignment of downstream processing and business operations – are you experiencing positive ROI for each clinical source feed?

Collaborative member-centric approach with providers to deliver optimal care leading to accurate clinical data generation, superior outcomes, and reduced cost – are your providers incentivized to document & share accurate clinical data and to provide optimal care?

Instilling trust and confidence with providers and care coordinators while transitioning prevailing operational and reporting systems through improved transparency, precision and accuracy – are your providers prioritizing and seeing the same view as you are seeing for driving quality improvement?

Easy accessibility with extensible security while working towards an interoperable ecosystem with flexibility to authorize and authenticate variety of involved stakeholders accessing information – do you have an enterprise policy for accessing your systems of quality analytics by internal and external users for a unified and seamless experience ?

Reference links

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HL7.FHIR.US.DAVINCI-DEQM\Medication Reconciliation Post-Discharge (MRP) - FHIR v4.0.1

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About CitiusTech

CitiusTech (www.citiustech.com) is a leading provider of healthcare technology services, solutions and platforms to over 120 organizations across the payer, provider, medical technology and life sciences markets. With over 5,000 technology professionals worldwide, CitiusTech powers healthcare digital transformation through next-generation technologies, solutions and accelerators. Key focus areas include healthcare interoperability & data management, quality & performance analytics, value-based care, omni-channel member experience, connected health, virtual care coordination & delivery, personalized medicine and population health management.

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In 2021 alone, Advent audited 480 HEDIS data submissions, approximately 18% of all submissions, on behalf of 58 health plans ranging from small county based to large national health plans. Members of Advent's audit team have been conducting performance measurement audits since the mid-1990s. Advent is certified as a Women's Business Enterprise (WBE) through the Women's Business Enterprise National Council (WBENC) and is a certified Small Women-Owned Small Business (WOSB).