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Reinventing Dental Insurance

How Decentralization Could Change Everything

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For decades, dental insurance claims have followed a familiar and successful pattern that includes gathering the relevant member, provider and benefits data, processing claims, sending out explanations of benefits and making payments. The administration of this process requires non-integrated systems to transfer and duplicate data which creates complexity and slows down the overall claim processing time.

This process doesn't have to continue to be this complicated.



Imagine in the not-so-distant future where dental insurance processes operate on decentralized Web3 infrastructure, potentially using Tim Berners-Lee's Solid Protocol.*

* SOLID PROTOCOL

Tim Berners-Lee, the inventor of the World Wide Web, developed the Solid Protocol to improve how personal data is shared and managed online. Over time, as digital services grew, so did the complexity of managing data across systems for both individuals and organizations.

Solid introduces the idea of a personal data "wallet," where you store your information in one secure place and choose who can access what. It's designed to create a win-win: individuals gain more clarity and control over their data, while organizations benefit from more accurate, up-to-date information shared with consent and purpose.

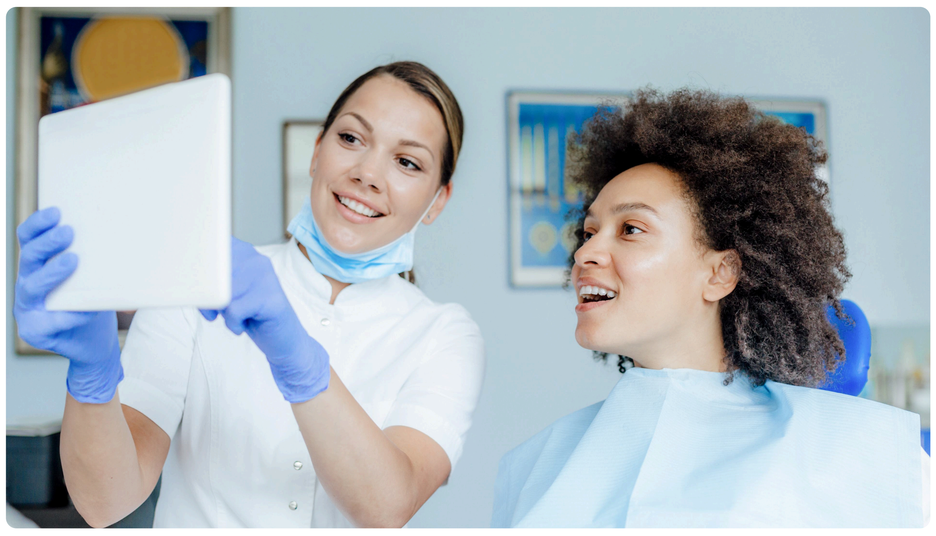
For example, instead of repeatedly filling in your details across services, you can allow a trusted site to access only what's needed, making processes smoother, safer, and more efficient for everyone.

Rather than data being duplicated and dispersed, each patient controls their data through a personal wallet. These patient-centric digital wallets provide a place to securely store and manage their own health information. Providers and insurers securely access precisely what they need and exactly when they need it which dramatically simplifies interactions and streamlines the entire claims process. The data gets decentralized to the patient rather than having to be centrally stored with providers and insurers.

Let’s take a real-world scenario and see how it would work.

Claire (a patient), opens her dental app (based on the Solid Protocol) to book a cleaning at **CareSmiles Dental**. With a few taps, Claire finds an available slot and books her dentist appointment. Upon scheduling, the app asks Claire if she’d like to share relevant data from her wallet with the dentist’s office. (Solid lets Claire keep all her health and insurance information in a private decentralized wallet under her control).

Claire clicks “Yes,” granting *CareSmiles Dental* and their practice management system secure, permissioned access to exactly the information they need. Her insurance details, dental history, and even prior x-rays (stored in her wallet) are instantly accessible to the dentist’s system.



Meanwhile on the provider side, *CareSmiles Dental* sees Claire’s appointment and, thanks to Solid’s seamless data inter-operability, has immediate access to her pertinent records. Before Claire even arrives at her appointment, *CareSmiles Dental* have opened their dashboard (which is also integrated with Solid Wallet’s API) showing Claire’s insurance eligibility and coverage for typical procedures. *CareSmiles Dental* does not need to access multiple different portals to find Claire’s information and determine her eligibility.

The practice management software, with Claire’s consent, reads her insurance plan details and past procedure codes straight from her wallet securely and instantly.
The Solid protocol ensures that any access to her wallet is auditable and logged and only allowed with her approval, giving Claire the power to control who’s viewing her information and when.



After Claire’s check-up and a painless cavity filling, *CareSmiles Dental* office admins prepare to file an insurance claim. Instead of the traditional process of sending claims through a central clearinghouse, insurance portal or even by paper through the mail, the clinic’s system submits the claim directly to Claire’s wallet.



In effect, Claire's wallet becomes the hub for the claim. It now contains the treatment details, billing codes, x-ray images, and any notes required for the insurance company to process the claim. Because Claire's insurer is part of the Solid ecosystem, her wallet automatically notifies the insurance company (let's call them *TeethCover Insurance*) that a new claim is available.

At *TeethCover Insurance* the claims processing system gets a notification message and accesses the claim in Claire's wallet using their granted permissions. All the data needed to adjudicate the claim (procedure codes, dates, dentist's notes, attachments, Claire's up-to-date coverage info) is right there. All parties (patient, provider, and payor) are now working from the *same source of truth* rather than disparate systems.



Since the claim information is complete and accurate, *TeethCover Insurance* can move the claim forward for processing. In this future scenario, much of the claim's review might even be automated by smart contracts or AI, but even when manual clinical review is needed, it's far quicker with the immediate data availability.

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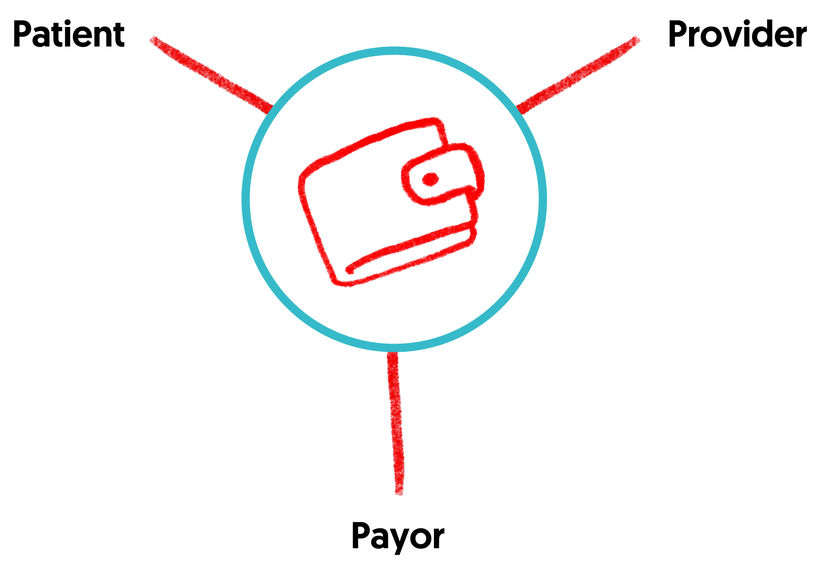
In our scenario, in real time, the claim is approved. Claire receives a notification in her app informing her that her insurance company has successfully processed the claim (auto-adjudicated the claim with no manual intervention on the payor side). *CareSmiles Dental* office admins simultaneously see the claim status update in their system. This eliminates the need to check an external portal or make a phone call to inquire about the status of a claim. All parties with access to Claire's wallet get the updates at the same time. The insurance company places an explanation of

benefits (EOB) document into Claire's wallet for her records. In this scenario Claire has an out-of-pocket cost of $30 and payment is taken while Claire is checking out immediately after her procedure while still in the dentist's office.



If *TeethCover Insurance* needed additional information (for example, a more detailed x-ray to approve a crown), they could post that request in Claire's wallet which would then be visible to both Claire and *CareSmiles Dental* immediately. In our scenario, while Claire is still in the dentist's office following her procedure, *CareSmiles Dental* could then take the additional X-rays while she is still in the office, avoiding having to schedule Claire to come back at a future date for these additional X-rays. Having everyone interact within the same secure digital space eliminates back-and-forth phone tag, snail-mail or clearing houses interactions which add time, cost and frustrations.

The Solid-based system acts like a *patient-owned workspace* that brings patient, provider, and payor together. It feels less like filing an insurance claim and more like collaborating on a shared document with each party adding what they need and seeing the part of the picture they need in real time. This scenario might sound futuristic or too difficult to realize, however the protocols and technology already exists.



Benefits of Decentralization via Solid Protocol

The scenario described is a disruption to the current centralized model which benefits the **patients, providers, and payers** involved in some of the following ways:`



Patients: *You own your data.*

- In a Solid-powered dental insurance world, patients like Claire have control and ownership of their personal information. Your health data isn't scattered across clinics and insurance databases; instead, it lives in your personal wallet, and you decide who gets to see or see who can or has used it.
- Only authorized parties (dentist, payors, etc.) can access what you choose to share, and only for as long as you permit. The overall experience becomes more transparent; you can see your treatment records, claims, and statuses in one place (your wallet).
- Instead of calling the insurance company for an update, you can simply check your app where the latest status is readily available.
- This level of insight and control builds trust as patients are no longer in the dark about what's happening with their claims or data.



Providers (Dentists and Clinics):

- Reducing the administrative overhead of accessing multiple payor portals for eligibility lookup and increases the speed for claim processing.
- Submitting insurance claims is more streamlined in writing to the patient's wallet in a standardized format.
- Reducing their risk exposure by storing less data.
- Better patient relations - if a claim is delayed, the dentist can see why and address it, rather than telling the patient to "contact your insurer."



Payors (Insurance Companies):

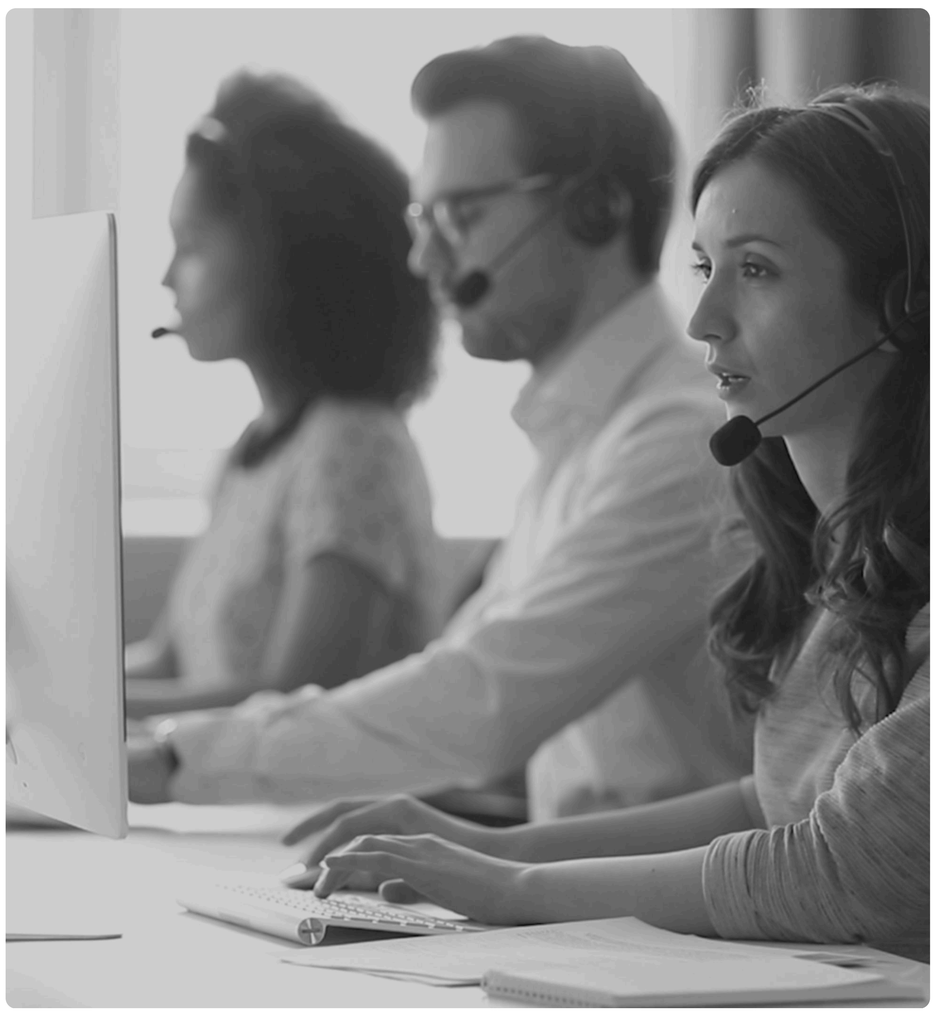
- Reduce security risk of storing large amounts of Private Health Information (PHI) data.
- Significantly reduce the administrative burden and overhead cost of gathering member and provider data into centralized databases. This **on-demand data access** can dramatically speed up claims processing.
- Reduce fraud and errors. It's harder for false claims to slip through when each claim's data is transparently shared and traceable to its source in a Solid wallet scenario. Any modifications are within the audit trail of that wallet's history.
- Communicate with providers and patients within the wallet, creating a log of what information was requested or provided.
- Shift from being seen as bureaucratic black boxes to **collaborative partners** in care.
- Implement value-based models, offer personalized tips or incentives by leveraging patient data in a respectful way.



The Road to Decentralization

Disruption is never simple and the path to adoption not a straightforward one. The journey would begin creating secure online wallets and user-friendly apps so dentists and patients can safely manage dental records (based on industry standards like *HL7 FHIR*). Following the creation of these platforms would then require running some initial pilots to test and iterate on the go-to-market readiness.

The challenge of integration between the existing enterprise systems of practice management and claims adjudication systems is the next step in the process. With the advancement and availability of integration APIs, this becomes manageable to connect the wallets in an end-to-end manner with other enterprise systems. Run both systems side-by-side for comparison, work out the tweaks and show value.



Then the challenge becomes growing adoption for the newly-created platform. Insurance companies could incentivize adoption through benefits such as quicker processing times and reduced fees. Dental software vendors could make wallet connectivity standard, providing simple tools and support to help with smooth onboarding. Adoption depends on minimizing disruption and creating a clear sense that the value of the new system outweighs the cost and effort of migrating to it.



Ultimately, the system could become fully decentralized, replacing older methods entirely. Advanced features like analytics and AI can use anonymous wallet data (with patient approval) to improve dental care without compromising privacy. Wallets will seamlessly integrate dental and broader health data, offering patients a unified health record.

There are many challenges to overcome (and certainly not all are covered here), however a new paradigm could allow for managing of dental information with wallets to become a natural part of everyday life for patients, dentists, and insurers alike. Decentralized dental data with its many benefits could become the comfortable and obvious choice, opening new areas of innovation and growth in the dental insurance space.

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