



The Problem-Oriented Health Record Standard (POHR)
– A Pathway to Reducing Clinician Burden

Presented by Lincoln Weed (based in part on [2020-05-14 POHR paper](#))

- **Outline of topics**

- Clinician burdens — POHR mechanisms to reduce burdens; two sources (3-4)
- POHR background (5-7)
- Types of POHR guidance and effects on clinician burdens (8-13)
- Consumer/patient role (14)
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Outline of slides

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Two sources of clinician burden	How problems and the problem list evolve
A core issue addressed by POHR standard	Consumer/patient role
Origin and goals of the POHR standard	Excerpts from publications by clinician users
What does problem-orientation mean?	Diagrams of POHR structure and total system of care
POHR core requirements – process guidance	Selected further reading
How POHR structure reduces clinician burdens	

POHR mechanisms of action for reducing burden

- By making the record a guidance tool, not just a data repository, the POHR standard reduces cognitive load. That burden reduction is a byproduct of fixing a root cause of medicine's failures of quality and economy — misplaced reliance on the autonomous human mind, with all its fallibility and opaque, idiosyncratic judgments.
- Specifically, POHR standard of care reduces clinician burdens in multiple ways, including:
 - Promotes orderly, systematic, step-by-step, consistent planning and problem-solving — which are less burdensome than ad hoc, on-the-fly, reactive, variable approaches
 - Groups related information together, rather than scattering it throughout the record
 - Implicitly organizes multiple clinicians and patient into functional teams for each problem
 - Structure and substructure of POHR provides logical context for entering and finding data
 - Transparency and intuitive logic of POHR enhance patient involvement, which helps clinicians
 - High quality documentation is automatic byproduct of using POHR guidance tool
 - Avoids reinventing the wheel and other inefficiencies from pointless recordkeeping variations
 - POHR organization and transparency help satisfy external business and regulatory needs
 - All these benefits dramatically reduce psychological stresses on clinicians

Two sources of clinician burden

- Clinician burdens can be categorized as external and internal*
 - External burdens are those imposed by parties outside the clinician-patient interactions — parties such as administrators, insurers, regulators
 - Internal burdens are those resulting from clinical dysfunction within medical practice. Clinical dysfunction is root cause of much clinician burden.
- POHR is a clinical standard of care, and thus directly relevant to internal rather than external burdens
- Using POHR to improve clinical functioning internally means outside parties have less reason to impose external burdens

* Compare the following from RCB Project Clinical Workflow Paper-21Jan2020 (p. 1): “EHR-related clinician burdens ... fall into two categories: those related to interactions between clinicians and the regulatory and organizational environment, but implemented via the EHR (extrinsic), and those caused by interactions between clinicians and the EHR technology itself (intrinsic).” See also the notes page.

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Consider also the following from the RCB Project Clinical Workflow paper (p. 15):

Intrinsic burdens. EHRs rely too heavily on simply representing paper-based standards and on forcing clinicians to conform to a rigid, idealized image of workflow that often bears little resemblance to actual clinical practice. It will take disruptive innovation to progress beyond these limitations and create systems that accommodate the inevitable variability in patient care and more effectively support clinical workflow.

This is a valuable statement except for concluding reference to “support clinical workflow.” Current clinical workflow is part of what needs to be disrupted. Current clinical workflow cannot possibly “accommodate the inevitable variability in patient care,” because doing so requires (1) information processing that the human mind cannot handle, and (2) disciplined, transparent, standard processes that autonomous physicians tend to resist. See generally the *Medicine in Denial* book.

A core issue motivating the POHR standard

- The following description of EHRs from 2015 could have been written 50 years earlier, when the POHR was introduced:

“Although there are some common conventions for structuring medical records (both in paper and electronic formats), much of the content of the record depends on what the physician chooses to include, and thus there may be variations in the extent to which clinical reasoning is documented (e.g., what alternative diagnoses were considered, the rationale for ordering [or not ordering] certain tests, and the way in which the information was collected and integrated). Both regulatory and local rules affect which members of the diagnostic team contribute to the documentation in a medical record and how they contribute.” From IOM/NASEM, [Improving Diagnosis in Health Care](#), Sep. 2015, p. 103 (emphasis added)

- POHR defines standards of care for how to structure the record, what content to include, documentation of clinical reasoning, feedback loops for monitoring, and other elements of orderly decision making

Origin and goals of the POHR standard

- POHR intended to bridge gap between scientific research and health/medical practice, by using health record as guidance tool, not just a repository
 - Research allows focus on single defined issue under controlled conditions
 - Practice demands addressing multiple patient problems under real-world conditions
- Tolerating lack of scientific rigor has led to focusing on medical rather than broader health issues, with medical practice being little more than —
 - An artisanal craft, practiced with widely varying levels of skill
 - A commercial enterprise, operating at widely varying levels of quality
- New form of health practice would define and enforce high standards of scientific behavior, within a total system oriented toward patient problem-solving, not provider or payer concerns. This orientation prioritizes quality, and it leads to individualized rather than standardized decision making.

What does problem-orientation mean?

- Problem-oriented system of care must satisfy three inter-related standards
 - Full range of patient needs should be defined as problems to be solved or managed. Each problem should be addressed in light of the others, not in isolation
 - Health record entries by all clinicians, not just doctors, should be grouped by the problems to which they relate, not by the sources generating the data*
 - Problems should be defined in terms of the patient's verified realities, not provider beliefs or third party expectations or population-based generalities. This demands recognizing each patient's status as the expert specialist in his/her uniqueness.
- These standards must be operationalized with two information tools, offering both process guidance and informational guidance – see pp. 8, 11
- Using these tools makes possible a system for harvesting new knowledge from health records with scientific rigor – see diagram at p. 18 below

* See notes page

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The second POHR standard (that all clinicians should enter data under problem to which data relate) accomplishes both goals stated in the following from the RCB Project Clinical Workflow paper (p. 16):

Instead of requiring physicians to fetch each piece of information from different drawers of the filing cabinet one by one, EHRs must assist in aggregating, organizing, and presenting relevant context-specific information to the clinician. Other members of the care continuum (e.g., trained medical assistants and especially patients) should be more actively included in the documentation and data entry process, freeing clinicians to keep their full attention focused on clinical care and communication.

As to “population-based generalities,” mentioned in the third sub-bullet, see *Medicine in Denial*, Part III.C (pp. 51-52), and Part VII (pp. 177-194).

POHR core requirements – process guidance

- **Complete problem list** - provides context, and protects against omission
 - All health-related problems must be identified and addressed, not limited by the personal knowledge or interests of clinicians patient happens to encounter
 - Problems include psychosocial needs and social determinants of health
- **Structure** - data categories for all record entries by all practitioners. Simply by **populating** these categories, POHR users organize processes of care:
 - Initial screening database (not problem-specific)
 - Problem list (preliminary, then defined by initial investigation)
 - Progress notes in SOAP format (**S**ymptomatic and **O**ther data, **A**ssessments, **P**lans), with notes entered under problem to which they relate (see diagram at p. 17 below and detailed explanation of data categories in [POHR paper](#), pp. 10-14)
- **Verifiability** - records must have scientific Integrity
 - Problems should be stated in verifiable terms, followed by hypotheses and testing
 - Data category structure guides verification processes for each problem
 - Inputs (data and practitioner performance) must be defined and controlled

How POHR structure reduces clinician burdens

- Complete problem list* reveals patient's total needs at a glance
 - Protects clinicians and patients against overlooking problems
 - Enables each problem to be considered in light of the others
- Grouping data by problem (rather than by data source) keeps related data together, not scattered through the record
 - This structure gives all clinicians (and patient) a unified view of all encounter notes, care plans, orders, discharge summaries, etc. for each problem
 - But this problem-oriented structure breaks down when problems are not linked to orders of drugs, tests, procedures, etc., or when a single encounter note mixes together material relating to multiple problems

* See notes page

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EHR problem lists as described in Atul Gawande's "Why Doctors Hate Their Computers," *The New Yorker*, Nov. 12, 2018:

The [problem] list is intended to tell clinicians at a glance what they have to consider when seeing a patient. Sadoughi used to keep the list carefully updated—deleting problems that were no longer relevant, adding details about ones that were. But now everyone across the organization can modify the list, and, she said, "it has become utterly useless." Three people will list the same diagnosis three different ways. Or an orthopedist will list the same generic symptom for every patient ("pain in leg"), which is sufficient for billing purposes but not useful to colleagues who need to know the specific diagnosis (e.g., "osteoarthritis in the right knee"). Or someone will add "anemia" to the problem list but not have the expertise to record the relevant details; Sadoughi needs to know that it's "anemia due to iron deficiency, last colonoscopy 2017." The problem lists have become a hoarder's stash.

"They're long, they're deficient, they're redundant," she said. "Now I come to look at a patient, I pull up the problem list, and it means nothing. I have to go read through their past notes, especially if I'm doing urgent care," where she's usually meeting someone for the first time. And piecing together what's important about the patient's history is at times actually harder than when she had to leaf through a sheaf of paper records. Doctors' handwritten notes were brief and to the point. With computers, however, the shortcut is to paste in whole blocks of information—an entire two-page imaging report, say—

rather than selecting the relevant details. The next doctor must hunt through several pages to find what really matters.

<https://www.newyorker.com/magazine/2018/11/12/why-doctors-hate-their-computers>

How POHR structure reduces clinician burdens (cont'd)

- **Defined data categories*** reduce cognitive load by guiding clinicians through orderly, complete data collection and follow-up, accomplished simply by populating the categories. Examples of data categories are:
 - Pre-defined initial database;
 - Problems defined in terms of goal basis, status, disability;
 - SOAP note components (Symptomatic and Other data, Assessments, Plans)
- **Better data collection and follow-up protects against crises (and associated burdens on clinicians) arising from neglected issues**
- **POHR structure is intuitive and readily understood by everyone, which helps them navigate the record and reduces communication burdens on clinicians**

* See p. 8 and link there to detailed listing of description of POHR data categories and subcategories

Problem-oriented informational guidance: clinical decision support tools for coupling knowledge with patient data (health & medical)

- Process guidance via health record standards is insufficient for problem-oriented system of care. Inputs to records are determined by doctors' unaided minds, which are too fallible to couple vast knowledge with complex data. "Knowledge coupling" tools to aid the mind are thus essential.
- Tools guide detailed patient data collection and coupling the data with vast knowledge about what combinations of data points mean (combinatorial analysis). The tools must be employed habitually, not selectively, before clinical judgment. This standard of care then permits users to add to, but not subtract from, tool-driven guidance (giving context to free text entries).
- These knowledge coupling tools are problem-specific. They require:
 - User-level tools for coupling distilled general knowledge with patient-specific data
 - Literature reviews and distilling content into structured form, using special tools
- These tools radically reduce clinician burden of handling vast knowledge

How problems and the problem list evolve

- Problem starts as unexplained symptom, physical finding, or sign
 - Patient experiences symptom, e.g. shortness of breath, feeling it as abnormal
 - Clinician observes abnormalities, from physical exam, lab test, etc. (e.g. EKG)
 - Problem should initially be stated as presented, without diagnostic guesses
- Patient and clinician then jointly do initial work-up of problem
 - They should be guided by knowledge coupling tool specific to problem, specifying detailed findings to check from history, physical exam, and basic lab tests, each finding being recorded as positive, negative or uncertain
 - If not already done, a general screening exam should also be done, to assure identifying all problems (which may bear on problem at hand)
- Initial problem statement is then re-defined

How problems and the problem list evolve (cont'd)

- **Problem re-defined in terms of goal, basis, status, and disability**
 - Basis should reflect verified level of diagnostic understanding as one of:
 - Unexplained symptom or sign should remain defined on problem list as originally observed, if knowledge coupling results are insufficient to establish its cause
 - Physiologic finding, e.g. heart failure, if established as causing the abnormality, or
 - Diagnosis — the confirmed cause, e.g. arteriosclerotic heart disease causing heart failure
 - Frequently, a final diagnosis is manifested by several abnormalities, some or all being included on initial problem list as separate problems. Thus, confirming diagnosis entails consolidating those into single problem statement.
 - Sometimes one of those separate problems needs ongoing attention apart from what's done to manage the diagnosis. If so, the separate problem may stay on the problem list, but labeled as secondary to the diagnosis

Consumer/Patient Role

- Consumers must act as one of their own providers (prosumers)
- Just as they need to use and control their own health record tools to track and manage their care, so prosumers need to use knowledge coupling tools to investigate their symptoms. They can thus assume much of this clinician burden.
- Prosumers need to use both tools with clinicians jointly — but they must be able to initiate use of knowledge coupling tools unilaterally
 - Prosumers can't rely on clinicians to recognize when investigation is needed
 - They are the ones who experience symptoms—who notice changes from what feels normal. To investigate whether and how their symptoms might be medically significant, patients need web-based, knowledge coupling tools for problem-specific inquiries, before turning to MDs
 - Prosumers themselves answer history questions posed by the symptom-specific tool they use. Then they engage clinicians to conduct a physical exam, order lab tests, and enter those findings, per tool's guidance. Then the tool generates individualized output
 - Output is options (diagnostic possibilities or therapeutic alternatives) and evidence on each

Excerpts from publications by clinician users of POHR and knowledge coupling tools

“... Without this structure, we would have had a list of typed unstructured narrative statements that spoke about Pap smears being normal and Pap smears having Class III findings, spread out throughout the chart. Now, as the problem and diagnosis take shape over time, we can make the record cumulative. This saves an enormous amount of time by not having to redictate another note about the prior Pap smear history; all the relevant information is pulled together in the chart under the problem title and automatically dated by the computer, so that both the chronology and the clinical logic of the problem formulation are clear. ... The design of this software is simple and clear. We have been able to implement it without any computer literate staff. ... In no time at all, the computer is no longer a formidable learning task but a very easily used tool to make patient care more manageable and less time consuming.”

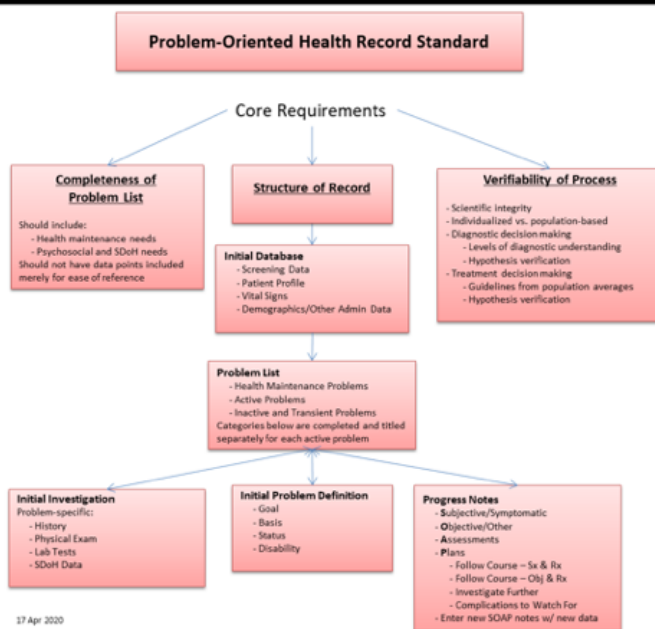
- From Dr. Ken Bartholomew, “The Perspective of a Practitioner,” [chapter 13](#) of [Knowledge Coupling: New Premises and New Tools for Medical Care and Education](#), by Dr. Lawrence L. Weed (LLW) et al. (Springer Verlag, 1991), p. 254 (here Dr. Bartholomew is describing his experience with DOS-based problem-oriented medical record software built in the late 1980s by Richard Hertzberg working with LLW and Chris Weed at PKC Corp.)

Excerpts from publications by clinician users of POHR and knowledge coupling tools (cont'd)

“If the patient has a new complaint for which there is a coupler and is to be seen in the office, s/he is directed to a Web portal to complete the medical history portion of the coupler and e-mail it back to us. That is loaded into the office coupler system. Patients who are unable to complete the medical history from home are instructed to come in before their appointment to complete their portion of the coupler in the office. Using the patient’s time for this process is key to gathering the detailed, standardized database for the couplers and saves staff and clinician time. If this process fails, the medical-history portion of the coupler can be completed by clinical staff in an examining room. ... Because our goal is to make quality the constant and time the variable, we want to match the amount of work with the appropriate amount of time.”

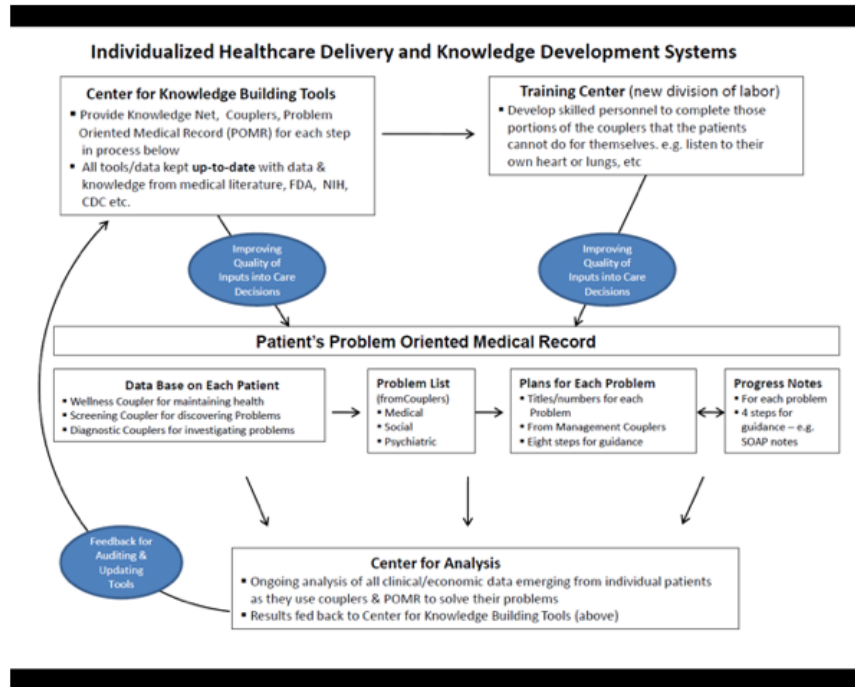
- From Dr. Charlie Burger, [The Use of Problem-Knowledge Couplers in a Primary Care Practice](#). *The Permanente Journal*, Volume 14 No. 1 47 (Spring 2010).

Diagram From Page 8 of [POHR Paper](#)



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Diagram From *Medicine in Denial* Page 13



Selected further reading

- Paper: Weed L, [The Problem-Oriented Record and Health Record Banks](#) (2020)
- Book: [Medicine in Denial](#) (2011), or free [downloadable, searchable PDF](#). The following portions may be of particular interest:
 - Part II.A (pp. 15-28) is a detailed analysis of a NEJM report on a case of diagnostic failure. See also pp. 29, 88-89, 100, 102-103, 180, 185 for follow-up discussion of that case. Related reading is an article ([Diagnosing diagnostic failure](#), 2014), which summarizes and expands on core concepts of *Medicine in Denial* from a diagnostic perspective. This relates mainly to knowledge coupling, not POHR.
 - Part IV (pp. 53-104) describes knowledge coupling tools in detail, including rebuttal to doctors' objections to the tools (parts IV.E & G)
 - Part VI (pp. 131-175) addresses the POHR in detail, including p. 174, discussing the need for institutions charged with developing and enforcing standards of care for managing health information.
 - Part V (pp. 105-129) and part VII (pp. 177-194), address epistemological and economic issues, including the limitations of population-based knowledge
 - Appendix A analyzes two clinical trials of knowledge coupling tool use at MHS and VA
- Article: Burger C. [The Use of Problem-Knowledge Couplers in a Primary Care Practice](#) (2010)

Selected further reading (cont'd — see also notes page)

- Book*: [Knowledge Coupling: New Premises and New Tools for Medical Care and Education](#) (1991). See especially Ch. 13, authored by Dr. Ken Bartholomew, describing his use of knowledge coupling and POHR tools in his rural primary care practice in South Dakota. See also Dr. Bartholomew's blog post, [Electronic Medical Records 2017: Science Ignored, Opportunity Lost](#).
- eBMJ article series*: [Opening the black box of clinical judgment](#) (1999).

Like *Medicine in Denial*, the above two publications cover knowledge coupling tools and the POHR as integrally related information tools for health practice, research and education. These publications overlap in part, but each includes significant material not in the others. The following items pre-date knowledge coupling tools and thus relate solely to the POHR, but they remain highly relevant:

- [Video](#): Grand Rounds by Larry Weed at Emory (1971)
- Book*: *Your Health Care and How to Manage It* (1975) - written for patients (PDF available)
- Conference proceedings on POHR, 1972 & 1973 (PDFs of two volumes, available from LW)

* Hard copies available for no cost (except shipping) from LW at ldweed424@gmail.com

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Blog post by Bob Wachter, "Putting the "A" Back in SOAP Notes: Time to Tackle An Epic Problem" (2012-09-03) at <https://thehospitalleader.org/putting-the-a-back-in-soap-notes-time-to-tackle-an-epic-problem/>. Both the post and the 50 comments are of considerable interest. The comments include a lengthy response by LLW and me, dated Sep. 10, 2012 — scroll about halfway down the page to see it.

A thoughtful set of three blog posts on the *Medicine in Denial* book, by Dr. Leslie Kernisan (a geriatrician). The third post with links to the earlier ones is at <https://thehealthcareblog.com/blog/2013/05/22/medicine-in-denial-what-larry-weed-can-teach-us-about-patient-empowerment/>.

Blog post by LLW and me, "Is Fee-for-Service Really the Problem?," dated Nov. 2, 2011, plus 21 comments, at <https://thehealthcareblog.com/blog/2011/11/02/medicine-in-denial/>.