A knowledge management system

- Extract and package best current knowledge
- Deploy into routine practice
- Continuously update and maintain
- Generate and validate new knowledge
Shared Baseline “Lean” protocols (bundles)

1. **Identify a high-priority clinical process** (key process analysis)

2. **Build an evidence-based best practice protocol**
   (always imperfect: poor evidence, unreliable consensus)

3. **Blend it into clinical workflow** (= clinical decision support; don't rely on human memory; make "best care" the lowest energy state, default choice that happens automatically unless someone must modify)

4. **Embed data systems to track (1) protocol variations and (2) short and long term patient results** (intermediate and final clinical, cost, and satisfaction outcomes)

5. **Demand that clinicians vary based on patient need**

6. **Feed those data back** (variations, outcomes) **in a Lean Learning Loop** - constantly update and improve the protocol
Org structure: Development Teams

- **Team leader**
  - respected physician leader, in active practice
  - functionally a knowledge expert

- **Core work group**
  - knowledge experts
  - build initial Care Process Model
  - provide academic detailing, run referral clinic
  - geographically base

- **Front line clinicians**
  - physicians, nurses, clerks, techs, etc.
  - first level review; keep knowledge experts grounded
  - 2-way street: fundamental knowledge up, ownership down
  - geographic representation

- **Staff support**
  - flow charter, statistician, data manager, clinical ops administrator
Managing clinical knowledge

Development Team responsibility – 
**build and maintain the Care Process Model (CPM):**

**Initial development phase**
1. Generate initial evidence-based best practice guideline *(flowchart)*
2. Blend the guideline into clinical workflow (standing order sets, clinical flow sheets, checklists, action lists, etc.)
3. Design variation, outcomes tracking system *(feed patient registries)*
4. Design patient and professional education materials
5. Deploy, test, and validate in actual care delivery

**Maintenance phase**
6. Keep the Care Process Model current *(protocol variations + patient outcomes; core experts: new research findings; improvement suggestions)*
7. core experts: **Academic detail front-line teams** *(Clinical Learning Days)*
8. core experts: **Run the referral clinic** *(last step in treatment cascade)*
9. core experts: **Manage specialist care managers**
Clinician roles

- Really interested? Serve on Development Team
  - About 3 to 6 hours per month
  - We’ll pay for your time (we’ll make you whole for time lost from practice)

- Somewhat interested? Respond when we circulate
  - We really want your expertise / ownership (but no $$ compensation)

- Just too much / way too busy? Just practice
  - Every time you vary you are criticizing the guideline
Benefits to patients and clinicians

- **Better clinical outcomes**
  - “We count our successes in lives”

- **Lower health care costs**
  - Eliminate waste;
  - e.g., Intermountain’s total operating costs down 13% ($688MM)

- **True transparency**
  - as clinicians counsel with patients

- **Higher productivity**
  - current workforce / physical plant can handle increasing demand

- **Dramatically better knowledge generation**
  - every patient contributes to new knowledge;
  - clinical effectiveness research fully embedded in routine practice
Every patient generates knowledge

- **58 longitudinal patient registries** representing about 80% of all inpatient and outpatient care delivered within Intermountain

- **about 3 petabytes** *(thousand terabytes)* of storage

- **primary use: routine clinical management** *(justifies operational expense)*
2015 “Type 1” learning production

- **Women & Newborn**: 84 peer-reviewed articles
- **Cardiovascular** *(2103 data)*:
  - 64 peer-reviewed articles
  - 67 abstracts
  - 15 "other" - book chapters, editorials, etc.

- **Other Clinical Development Teams also published**
  (just not as prolific as Women & Newborn and CV -- ~400 total articles)

- **Cumulative impact on cost of operations**: ~$688 million

**Goal**: 1,000 peer-reviewed Type 1 publications in a single year *(sometime before I retire)*