



Digital Health Data Primer

From Medical Claims
to Electronic Health Records

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What is Digital Health Data (DHD)?

Electronic clinical & claims data



CLAIMS DATA



DIAGNOSES



RX



PROCEDURES



TESTS



LABS

Obtained from a variety of digital health sources



HEALTHCARE
PAYERS & PBMs



HEALTHCARE
PROVIDER EHR



HEALTH INFO
EXCHANGES (HIEs)



CONSUMER
HEALTH PORTALS

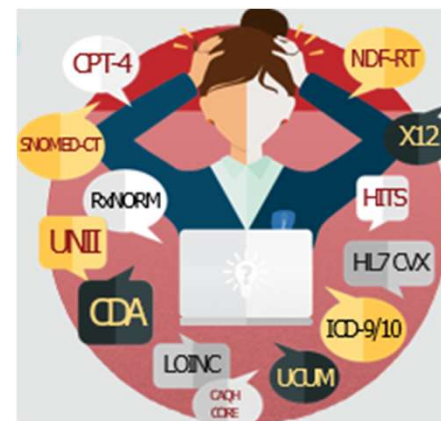


AGGREGATORS

Digital Health Data Codes

DHD is complex with hundreds of thousands of codes

Code Category	Code Sets	Total Code Volume
Drugs	RxNorm; NDC	625,000+
Labs	LOINC	85,000+
Procedures	ICD-9-PCS; HCPCS/CPT; ICD-10-PCS	100,000+
Diagnoses	ICD-9; ICD-10; SNOMED-CT	420,000+



Multiple medical vocabularies
in the form of codes and code sets must be carefully dissected and understood.

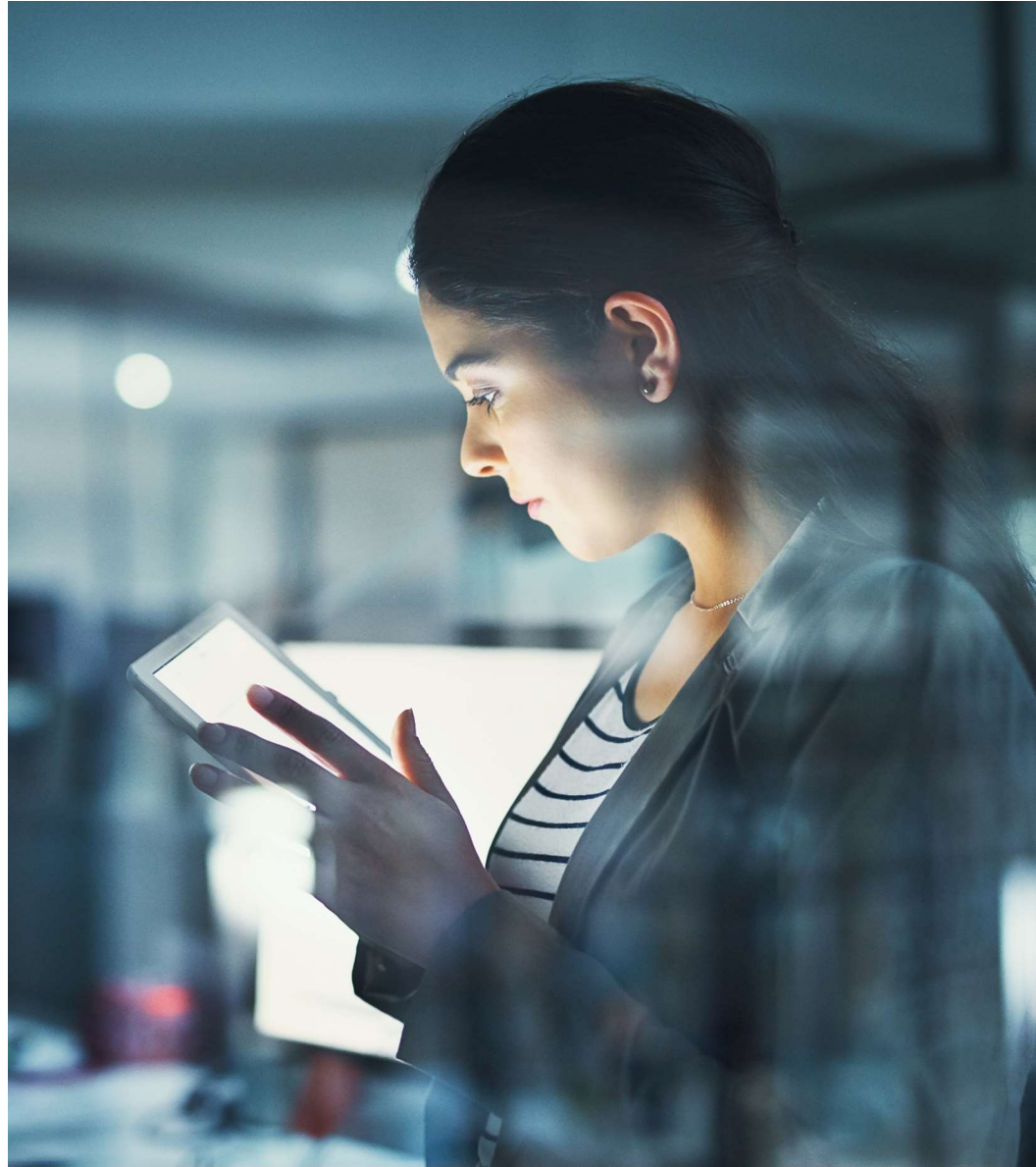
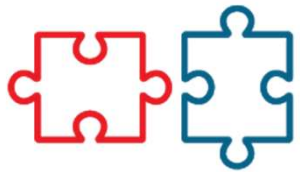
Effective underwriting with DHD requires a deep understanding of risk associated with each code and group of codes

Claims vs. EMR/EHR Data

	Claims Data	EMR/EHR Data
Scope of Data	Broad: Captures information from all doctors and providers caring for a patient for which medical claims were submitted	Limited: Captures only the portion of care provided by doctors and/or the health system from whom the CCD was obtained
Scope of Patients	Insured patients	Insured patients Uninsured patients
Prescription Drugs	Contains all prescriptions that were filled for which a medical claims was submitted. Includes dates of refills.	Contains only that a physician prescribed a drug, not whether it was filled/refilled
Non-Prescription Drugs	Not present	Present
Data Richness*	<ul style="list-style-type: none"> ✓ Diagnosis ✓ Labs (no results) ✓ Procedures (no results) ✓ Drugs filled 	<ul style="list-style-type: none"> ✓ Diagnosis ✓ Labs with results ✓ Procedures with results ✓ Drugs prescribed ✓ Vital signs ✓ Patient surveys ✓ Patient habits (e.g., smoking, etc.) ✓ Problem lists

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Separating the Noise from the Signal

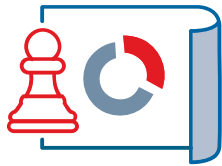


Digital Health Data: Before Scoring

Applicant Demographics: 55 Y/O Female; Non-Smoker; Height 5'3"; Weight 155; BP 125/85

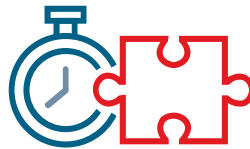
Code Value	Codeset	Code Description	Date Reported	Code Value	Codeset	Code Description	Date Reported
14760008	SNOMED	Constipation (disorder)	11/20/2018	280.9	ICD-9	Iron deficiency anemia, unspecified	3/6/2013
197321007	SNOMED	Steatosis of liver (disorder)	6/12/2018	626.8	ICD-9	Other disorders of menstruation and other abnormal bleeding from female genital tract	4/18/2012
235595009	SNOMED	Gastroesophageal reflux disease (disorder)	1/29/2018	724.2	ICD-9	Lumbago	12/17/2010
59621000	SNOMED	Essential hypertension (disorder)	1/29/2018	49218002	SNOMED	Hip pain (finding)	12/17/2010
267434003	SNOMED	Mixed hyperlipidemia (disorder)	1/29/2018	698.3	ICD-9	Lichenification and lichen simplex chronicus	8/28/2008
107615110001	SNOMED	History of pulmonary embolism on long-term anticoagulation therapy (situation)	1/29/2018	530.81	ICD-9	Esophageal reflux	4/3/2007
19101				564.1	ICD-9	Irritable bowel syndrome	4/3/2007
35489007	SNOMED	Depressive disorder (disorder)	10/27/2017	692.9	ICD-9	Contact dermatitis and other eczema, unspecified cause	2/8/2007
61582004	SNOMED	Allergic rhinitis (disorder)	10/27/2017	35489007	SNOMED	Depressive disorder (disorder)	11/14/2006
711150003	SNOMED	Long-term current use of anticoagulant (situation)	10/27/2017	717.9	ICD-9	Unspecified internal derangement of knee	8/30/2006
193462001	SNOMED	Insomnia (disorder)	10/27/2017	718.31	ICD-9	Recurrent dislocation of joint, shoulder region	8/30/2006
55822004	SNOMED	Hyperlipidemia (disorder)	10/27/2017	780.52	ICD-9	Insomnia, unspecified	8/30/2006
278860009	SNOMED	Chronic low back pain (finding)	2/17/2017	38341003	SNOMED	Hypertensive disorder, systemic arterial (disorder)	8/30/2006
239873007	SNOMED	Osteoarthritis of knee (disorder)	2/17/2017	472.0	ICD-9	Chronic rhinitis	8/30/2006
414916001	SNOMED	Obesity (disorder)	3/29/2016	715.90	ICD-9	Osteoarthritis, unspecified whether generalized or localized, site unspecified	8/30/2005
78275009	SNOMED	Obstructive sleep apnea syndrome (disorder)	3/29/2016	724.2	ICD-9	Lumbago	8/10/2005
48694002	SNOMED	Anxiety (finding)	12/3/2015	727.43	ICD-9	Ganglion, unspecified	3/23/2004
41975002	SNOMED	Insomnia with sleep apnea (disorder)	12/3/2015	599.0	ICD-9	Urinary tract infection, site not specified	3/23/2004
81576005	SNOMED	Closed fracture of phalanx of foot (disorder)	9/8/2015	466.0	ICD-9	Acute bronchitis	10/7/2003
564.00	ICD-9	Constipation, unspecified	9/12/2013	478.1	ICD-9	478.1 Other diseases of nasal cavity and sinuses	9/21/2003
21897009	SNOMED	Generalized anxiety disorder (disorder)	9/12/2013	477.8	ICD-9	Allergic rhinitis due to other allergen	8/4/2003
415.19	ICD-9	Other pulmonary embolism and infarction	8/28/2013	461.9	ICD-9	Acute sinusitis, unspecified	8/4/2003
				719.46	ICD-9	Pain in joint, lower leg	12/3/2002
				726.90	ICD-9	Enthesopathy of unspecified site	3/30/2001
				278.00	ICD-9	Obesity, unspecified	11/24/2000

Client Survey - DHD Challenges



Key Obstacles

- Cost
- Security governance
- Regulation
- Resources
- Agent/Client acceptance



Application Challenges

- Data quality
- Hit rates and coverage
- Understanding the data
- Use case analysis

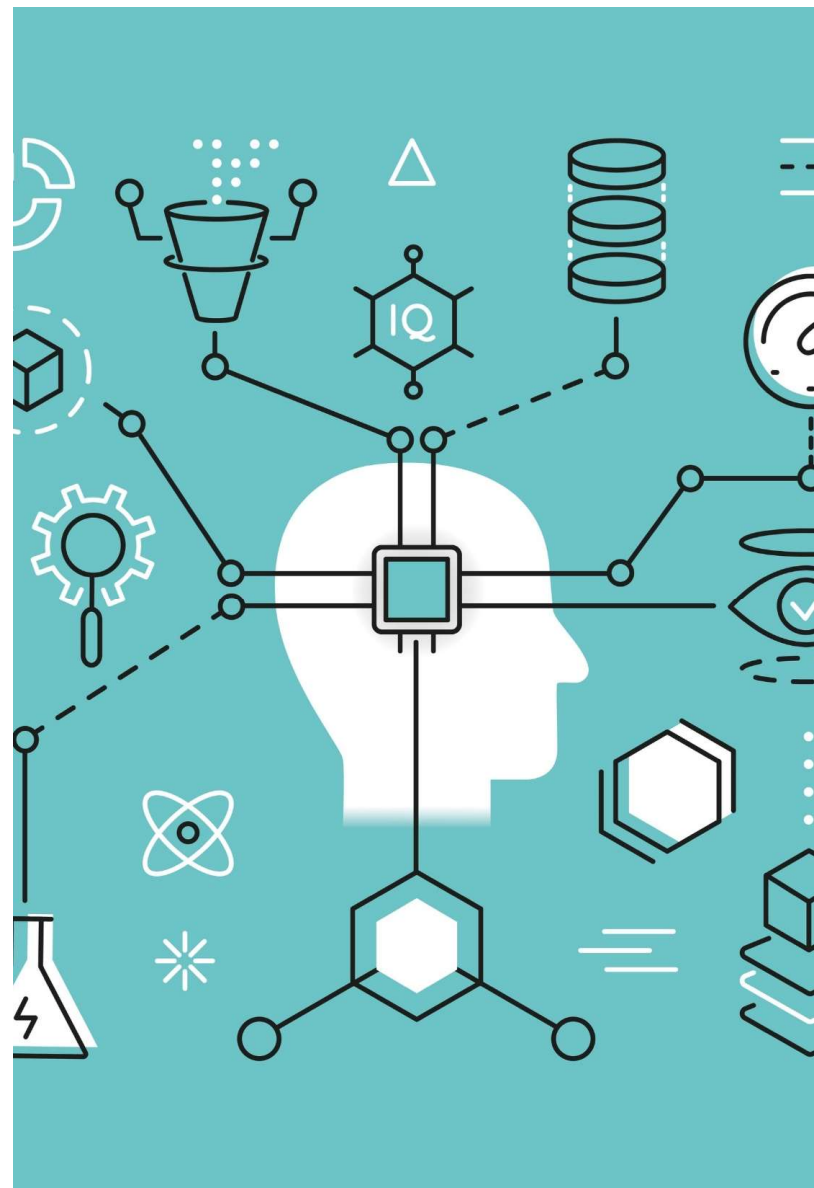


Client Recommendations

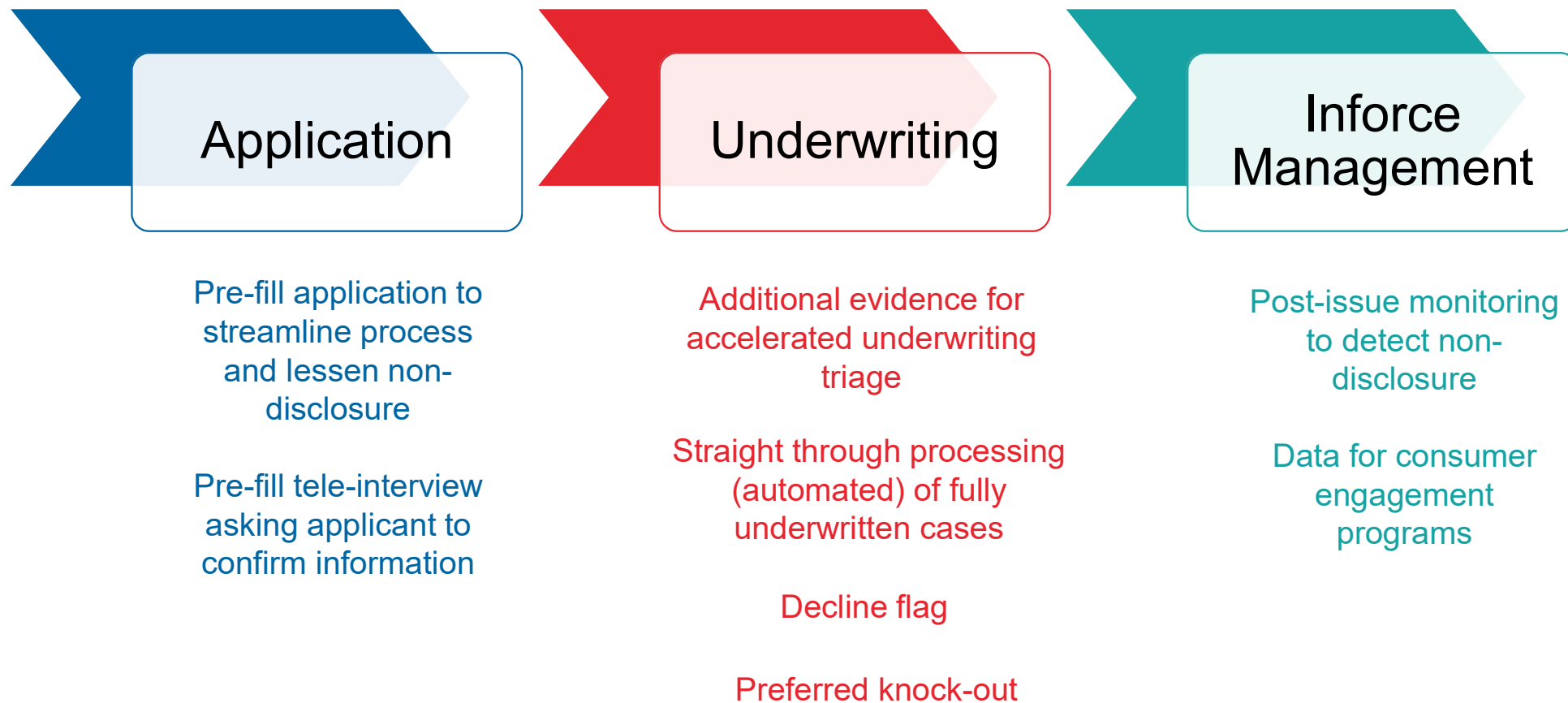
- Start small
- Learn the language
- Collaborate
- Manage expectations
- Expand over time

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Practical Applications



Digital Health Data Use Cases



DHD Complements Other Evidences



- ☐ Case: \$500,000 term policy application
- ☐ Evidences ordered; all normal except MIB
- ☐ MIB returns result indicating an abnormal cardiac finding
- ☐ DHD ordered and confirms benign cardiac murmurs
- ☐ Carrier approves as standard

Applicant Demographics*

- Male, Age 35; Married
- Height 6'0", Weight 184
- Average BP 118/78

All
Standard

Problem List

Approve

S52.92XA Left Arm Fracture

C89.11 Acute Pain due to Trauma

M12.55 Traumatic Arthropathy / hip

M7.671 Right Foot Pain

S83.512A Left Knee Ligament Sprain

R01.1 Benign & Innocent Cardiac Murmurs

G47.00 Insomnia, Unspecified

M23.52 Chronic Instability of Knee

S83.502S Sprain of unspecified cruciate ligament of left knee, sequela

DHD Complements Other Evidences



- ☐ Case: \$250,000 term policy application
- ☐ Evidences ordered; all normal except Rx history
- ☐ Rx history shows patient taking Raloxifene* for last two years
- ☐ DHD ordered and confirms applicant use of Raloxifene for bone density
- ☐ Carrier approves as standard

Applicant Demographics*

All
Standard

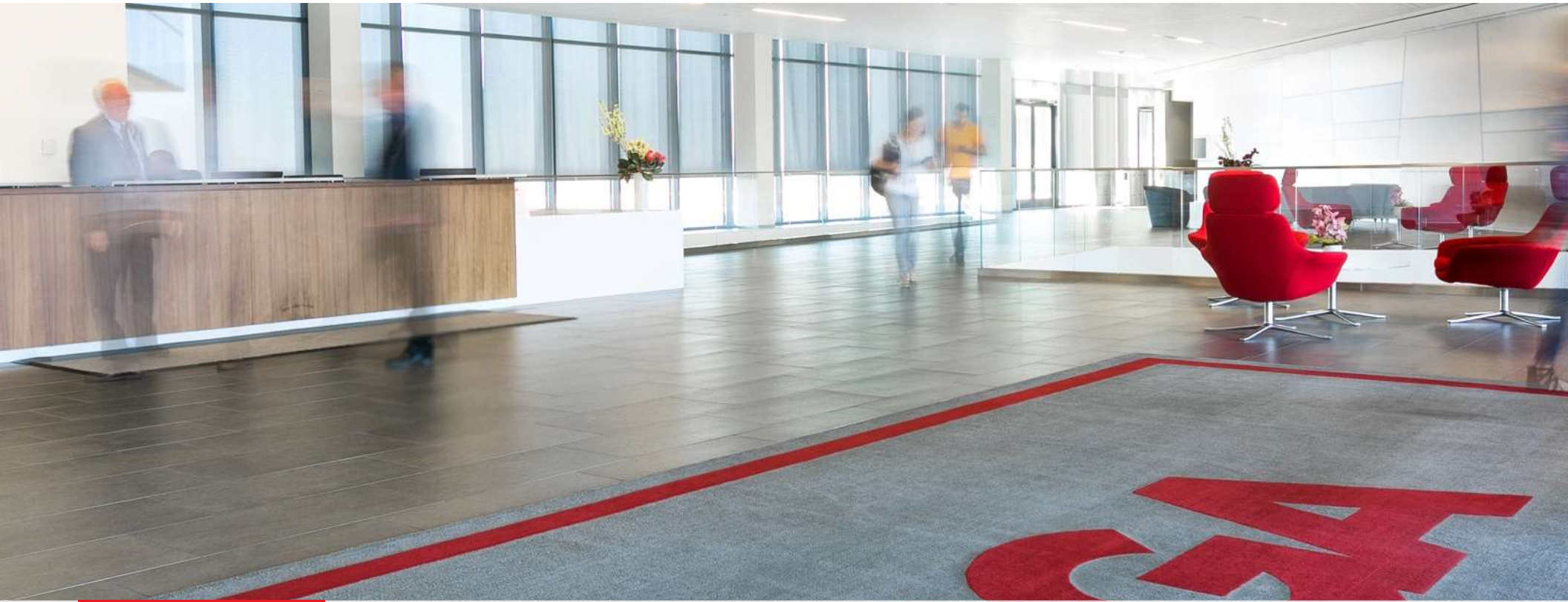
- Female, Age 49; Married
- Height 5'6", Weight 138
- Average BP 120/82

Problem List

Approve

34713006	Vitamin D Deficiency	M85.8	Other specified disorders of bone density and structure
272.4	Hyperlipidemia	G47.00	Insomnia, Unspecified
I10	Essential (primary) hypertension	E28.319	Asymptomatic premature menopause
K21.9	Gastro-esophageal reflux disease without esophagitis	E03.9	Hypothyroidism, unspecified

*Raloxifene has multiple indications including prevention of breast cancer and osteoporosis



Questions?

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