

# Health Informatics Skills Mastery Checklist

Rate each skill: 1-Novice — 2-Basic — 3-Intermediate — 4-Advanced — 5-Expert

## HEALTHCARE DOMAIN SKILLS

### Clinical Knowledge

#### 1. Medical Terminology & Clinical Knowledge

☐1 ☐2 ☐3 ☐4 ☐5

Understanding medical language, anatomy, disease states, diagnostics, medications, and clinical specialties.

#### 2. Healthcare Workflows & Care Delivery

☐1 ☐2 ☐3 ☐4 ☐5

Understanding clinical workflows across settings (inpatient, outpatient, ED, surgery, ICU) and care team coordination.

#### 3. Clinical Decision Support (CDS) Design

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of CDS tools (alerts, reminders, order sets) and best practices to reduce alert fatigue.

#### 4. Medication Management & E-Prescribing

☐1 ☐2 ☐3 ☐4 ☐5

Understanding medication lifecycle, CPOE, e-prescribing including EPCS, and medication reconciliation.

### Regulatory & Compliance

#### 5. HIPAA Privacy & Security Compliance

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of regulations governing Protected Health Information (PHI), Privacy Rule, Security Rule, and Breach Notification.

#### 6. HITECH Act & Meaningful Use

☐1 ☐2 ☐3 ☐4 ☐5

Understanding HITECH Act strengthening of HIPAA, business associate requirements, and quality reporting frameworks.

#### 7. 21st Century Cures Act & Information Blocking

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of patient access requirements, information blocking prohibitions, and FHIR API mandates.

### Healthcare IT Systems

#### 8. EHR Systems Architecture (Epic/Cerner)

☐1 ☐2 ☐3 ☐4 ☐5

Understanding EHR functionality, major vendors, system workflows, and integration points.

#### 9. Health Information Exchange (HIE) Architecture

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of HIE models, technologies (Direct messaging, query-based exchange), and national networks.

#### 10. Telehealth & Remote Patient Monitoring

☐1 ☐2 ☐3 ☐4 ☐5

Understanding telehealth platforms, RPM devices, wearables integration, and virtual care workflows.

### Data Standards & Interoperability

#### 11. HL7 Standards (v2.x)

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of HL7 messaging standards for clinical data exchange, including message structure and segments.

#### 12. FHIR (Fast Healthcare Interoperability Resources)

☐1 ☐2 ☐3 ☐4 ☐5

Understanding HL7's modern API-based standard using RESTful web services and FHIR resources (R4/R5).

#### 13. Clinical Terminologies (SNOMED CT, LOINC, RxNorm)

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of standardized vocabularies for semantic interoperability across systems.

#### 14. Healthcare Data Standards (X12, NCPDP, DICOM)

☐1 ☐2 ☐3 ☐4 ☐5

Knowledge of standards for administrative transactions (X12), e-prescribing (NCPDP), and medical imaging (DICOM).

### Coding & Billing

#### 15. ICD-10-CM & CPT Coding

☐1 ☐2 ☐3 ☐4 ☐5

Understanding diagnosis coding (ICD-10-CM with 70,000+ codes) and procedure coding (CPT with 10,000+ codes).

## 16. Value-Based Care & Reimbursement Models

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Understanding payment systems including fee-for-service, value-based purchasing, ACOs, and quality incentive programs.

## 17. Revenue Cycle Management

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Understanding revenue cycle processes from registration through payment posting and denial management.

## Quality & Population Health

### 18. Healthcare Quality Measures & Reporting

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Understanding quality frameworks (HEDIS, CMS, MIPS), measure specifications, and eCQM reporting.

### 19. Population Health & Risk Stratification

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Knowledge of population health tools including risk stratification, care gap identification, and care coordination.

### 20. Social Determinants of Health (SDOH)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Knowledge of SDOH concepts, ICD-10 Z-codes, screening tools, and community resource integration.

## Research & Public Health

### 21. Clinical Research Informatics

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Understanding clinical trial data management, research systems (REDCap), and regulatory requirements (FDA, IRB).

### 22. Public Health Reporting & Surveillance

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Understanding mandatory reporting requirements (notifiable diseases, immunizations, syndromic surveillance).

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## TECHNICAL/PROGRAMMING SKILLS

### CORE PROGRAMMING (Essential)

#### 1. SQL (Structured Query Language) - ESSENTIAL

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Standard language for managing and querying relational databases. Required for EHR data extraction. (90%+ of jobs)

#### 2. Python - ESSENTIAL

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Primary programming language for healthcare data science, ML/AI, automation, and API development. (60-70% of jobs)

#### 3. JavaScript/TypeScript

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

For building patient-facing apps, interactive dashboards, and SMART on FHIR applications.

#### 4. Specialization Language (Choose ONE: R/Java/C#)

Which? \_\_\_\_\_ ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

R for research/biostatistics; Java for Epic/enterprise systems; C# for Microsoft/Azure environments.

### DATABASES & DATA MANAGEMENT

#### 5. Relational Databases (SQL Server, PostgreSQL, Oracle)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Structured database systems for storing EHR data, understanding schema design, indexing, and optimization.

#### 6. NoSQL Databases (MongoDB, Redis)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Non-relational databases for unstructured data like medical imaging metadata, clinical notes, and FHIR resources.

#### 7. Data Warehousing & ETL (Airflow, SSIS, Data Factory)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Systems for extracting, transforming, and loading data from multiple sources into centralized repositories.

### DATA ANALYSIS & VISUALIZATION

#### 8. Tableau

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Industry-leading BI and visualization platform for healthcare dashboards and analytics. (50-60% of analytics jobs)

#### 9. Power BI

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Microsoft's business analytics tool integrated with Azure healthcare services. (40-50% of jobs)

## 10. pandas & NumPy (Python data libraries)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Core Python libraries for data manipulation, cleaning, transformation, and analysis.

## 11. Statistical Software (SAS/SPSS/Stata)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Specialized tools for advanced statistical computing, clinical trials analysis, and regulatory submissions.

## HEALTHCARE INTEROPERABILITY

### 12. FHIR API Development

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Technical implementation of FHIR including resource modeling, API development, and SMART on FHIR authorization.

### 13. HL7 v2 Message Processing

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Technical implementation of legacy HL7 messaging including parsing and interface engine configuration.

### 14. RESTful API Development

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Designing and implementing web-based APIs using REST principles, HTTP methods, and OAuth 2.0.

### 15. EHR Platform Expertise (Epic Clarity/Cerner CCL)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Platform-specific knowledge including EHR databases, scripting languages, and integration frameworks.

## MACHINE LEARNING & AI

### 16. Machine Learning Fundamentals

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Algorithms for supervised/unsupervised learning, model evaluation, and predictive analytics in healthcare.

### 17. Deep Learning & Neural Networks

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Multi-layered neural networks using TensorFlow/PyTorch for medical imaging and complex pattern recognition.

### 18. Natural Language Processing (NLP)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

AI techniques for processing clinical text using Clinical BERT, BioBERT, or MedSpaCy.

### 19. Generative AI & LLMs (GPT-4, Claude, etc.)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Implementation of large language models including prompt engineering, RAG, and ambient AI documentation.

## CLOUD PLATFORMS

### 20. AWS Healthcare Services

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Amazon Web Services including HealthLake, Comprehend Medical, and HIPAA-compliant architecture.

### 21. Microsoft Azure Healthcare APIs

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Azure Health Data Services, Synapse Analytics, and integration with Microsoft 365 healthcare tools.

### 22. Google Cloud Healthcare & BigQuery

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Cloud Healthcare API (FHIR, HL7v2, DICOM), BigQuery analytics, and Vertex AI.

## SOFTWARE DEVELOPMENT & DevOps

### 23. Git & Version Control

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Distributed version control for code management and collaboration using GitHub/GitLab/Bitbucket.

### 24. CI/CD & DevOps (Docker, Kubernetes)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Continuous integration/deployment pipelines, containerization, and orchestration for healthcare applications.

### 25. Data Security & Privacy Technologies

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Technical security measures including encryption, authentication (OAuth 2.0), and HIPAA technical safeguards.