

## **Detailed outputs in the first 3 steps of CDPEO construction**

The first 3 steps of CDPEO construction are:

1. Determine the domain and scope of CDPEO
2. Consider reusing existing ontologies
3. Enumerate important terms in CDPEO

### **Detailed outputs in Step 1: List of Competency Questions:**

These questions can be divided into two types: general questions and specific questions.

General questions include:

- Why build this ontology?
- What are the domains this ontology will cover?
- Who are the intended users of the ontology?
- What will this ontology be used for?
- What is the intended output of this ontology?
- What will the ontology use to make decisions?
- What resources will be considered to build the ontology?

Specific questions include:

- What are the specific patient characteristics required to recommend educational materials?
- What is the relation between patient characteristics and document topics?
- What are the main components of the intended label set?
- How do you customize a patient vector according to a patient profile?

### **Detailed outputs in Step 2: Searching Result of Existing Ontologies:**

We searched for reusable existing ontologies on BioPortal

(<https://bioportal.bioontology.org/ontologies>) using keywords “hypertension”, “diabetes”, “chronic disease,” and “patient education”. A total of 9 ontologies were screened.

- Hypertension Ontology (HTN)

The Hypertension Ontology is a realism-based reference ontology for semantically managing clinical data about hypertension.

- EmpowerBP (EBP)

Clinical practice guidelines, behavior change theories, and associated behavior change strategies for the management of hypertension.

- Diabetes Mellitus Diagnosis Ontology (DDO)

An ontology for diagnosis of diabetes containing the diabetes related complications, symptoms, drugs, lab tests, etc.

➤ **Diabetes Mellitus Treatment Ontology (DMTO)**

DMTO is an OWL 2 ontology for creating customized treatment plans for diabetic patients.

➤ **HL7 FHIR & SSN ontology-based Type 1 Diabetes Mellitus Ontology (FASTO)**  
 FHIR And SSN based Type 1 diabetes Ontology (FASTO) is an OWL 2 ontology for real time management of insulin for diabetes patients especially type 1 diabetics.

➤ **BioMedBridges Diabetes Ontology (DIAB)**

A diabetes ontology.

➤ **Ontology of Glucose Metabolism Disorder (OGMD)**

Including the disease names, phenotypes and their classifications involved in Glucose Metabolism Disorder, Diabetes.

➤ **Chronic Kidney Disease Ontology (CKDO)**

The Chronic Kidney Disease Ontology was developed to assist routine data studies and case identification of CKD in primary care.

➤ **COPD Ontology (COPDO)**

The COPD Ontology is a biomedical ontology used for modelling concepts associated to chronic obstructive pulmonary disease in routine clinical databases.

**Detailed outputs in Step 3: List of Collected Terms:**

➤ 患者 (Patients)	➤ 怀孕 (Pregnancy)
➤ 疾病 (Disease)	➤ 男性 (Male)
➤ 慢性疾病 (Chronic Disease)	➤ 女性 (Female)
➤ 高血压 (Hypertension)	➤ 老年 (Elderly)
➤ 糖尿病 (Diabetes)	➤ 青年 (Youth)
➤ 慢阻肺 (COPD)	➤ 超重 (Overweight)
➤ 冠心病 (Coronary Heart Disease)	➤ 生活方式 (Disease)
➤ 高血脂 (Hyperlipidemia)	➤ 吸烟 (Smoking)
➤ 脑卒中 (Stroke)	➤ 饮酒 (Drinking)
➤ 肾病 (Kidney Disease)	➤ 饮食 (Diet)
➤ 皮肤病 (Skin Disease)	➤ 运动 (Exercise)
➤ 眼病 (Eye Disease)	➤ 心理 (Mentality)
➤ 肺病 (Lung Disease)	➤ 生理参数 (Physiological Index)
➤ 肝病 (Liver Disease)	➤ 血压 (Blood Pressure)
➤ 胃病 (Stomach Disease)	➤ 血糖 (Blood Glucose)
➤ 人口学资料 (Demographic)	➤ 胆固醇 (Cholesterol)
➤ 年龄 (Age)	➤ 甘油三酯 (Triglyceride)
➤ 性别 (Sex)	➤ 高密度脂蛋白 (HDL)
➤ BMI	➤ 低密度脂蛋白 (LDL)

➤ 问卷调查 (Questionnaire)	➤ 尿酸 (Uric Acid)
➤ 实验室测试 (Lab test)	➤ 收缩压 (Systolic BP )
➤ 自我监测 (Self-monitoring)	➤ 舒张压 (Diastolic BP)
➤ 用药 (Medication)	➤ 每日吸烟 (Daily Smoking)
➤ 降压药 (Antihypertensive drug)	➤ 每日饮酒 (Daily Drinking)
➤ 降糖药 (Hypoglycemic drug)	➤ 并发症 (Complication)
➤ 降脂药 (Hypolipidemic drug )	➤ IPAQ
➤ 胰岛素 (Insulin)	➤ PHQ-9