

# **Introduction to MIMIC III**

**Daniel Capurro, MD, PhD**

# Some History

- Originated at the Laboratory for Computational Physiology at MIT, originally focused on physiological signal processing.
- Established Physionet, a repository of physiological data available for research.
- Created MIMIC repository: Medical Information Mart for Intensive Care
- MIMIC-II released in 2010
- MIMIC-III released in 2016



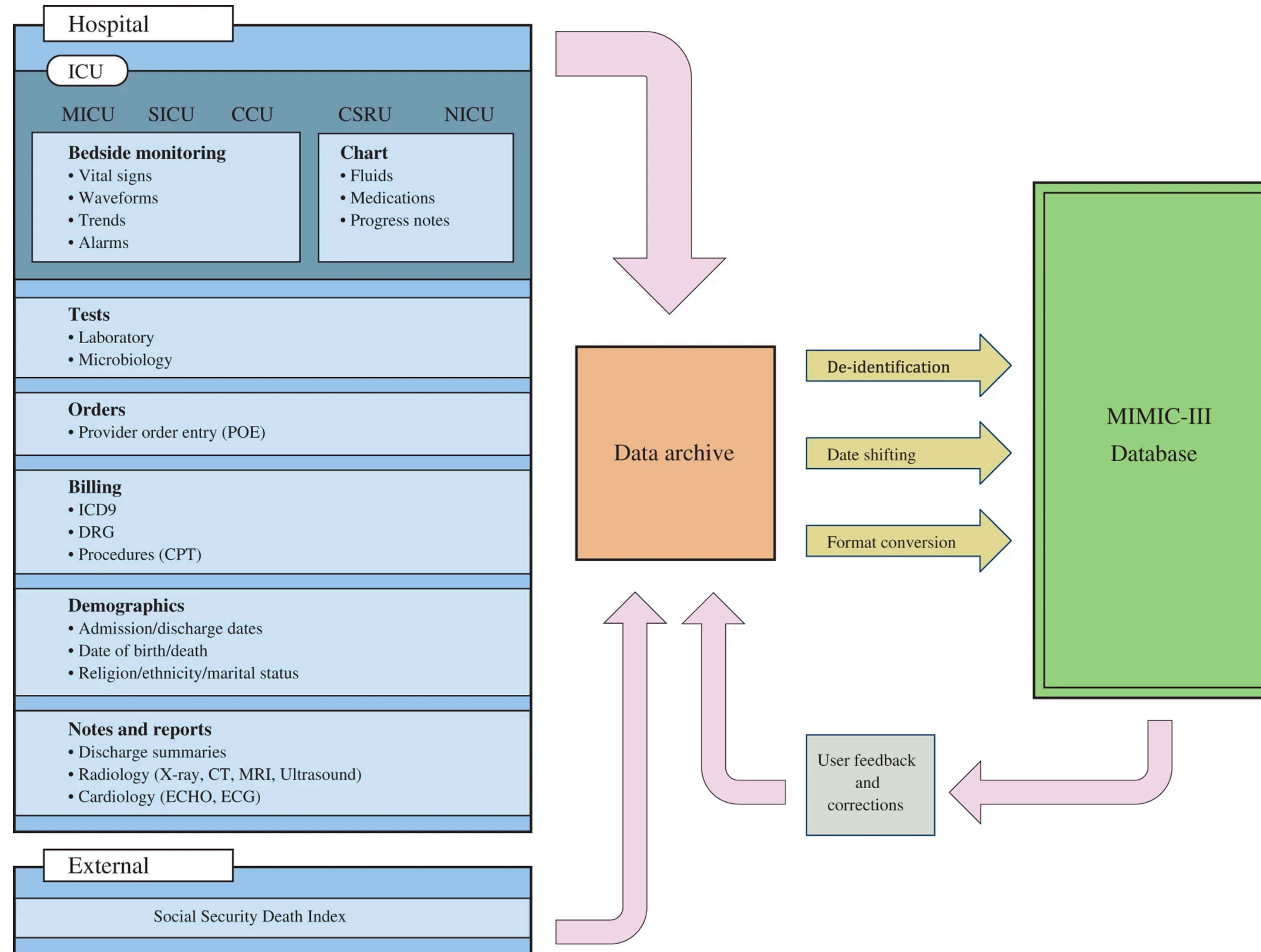
# What is MIMIC?

- Data mart
- One US hospital
- Critical care patient information
- Fully anonymized
- Available for research and quality improvement

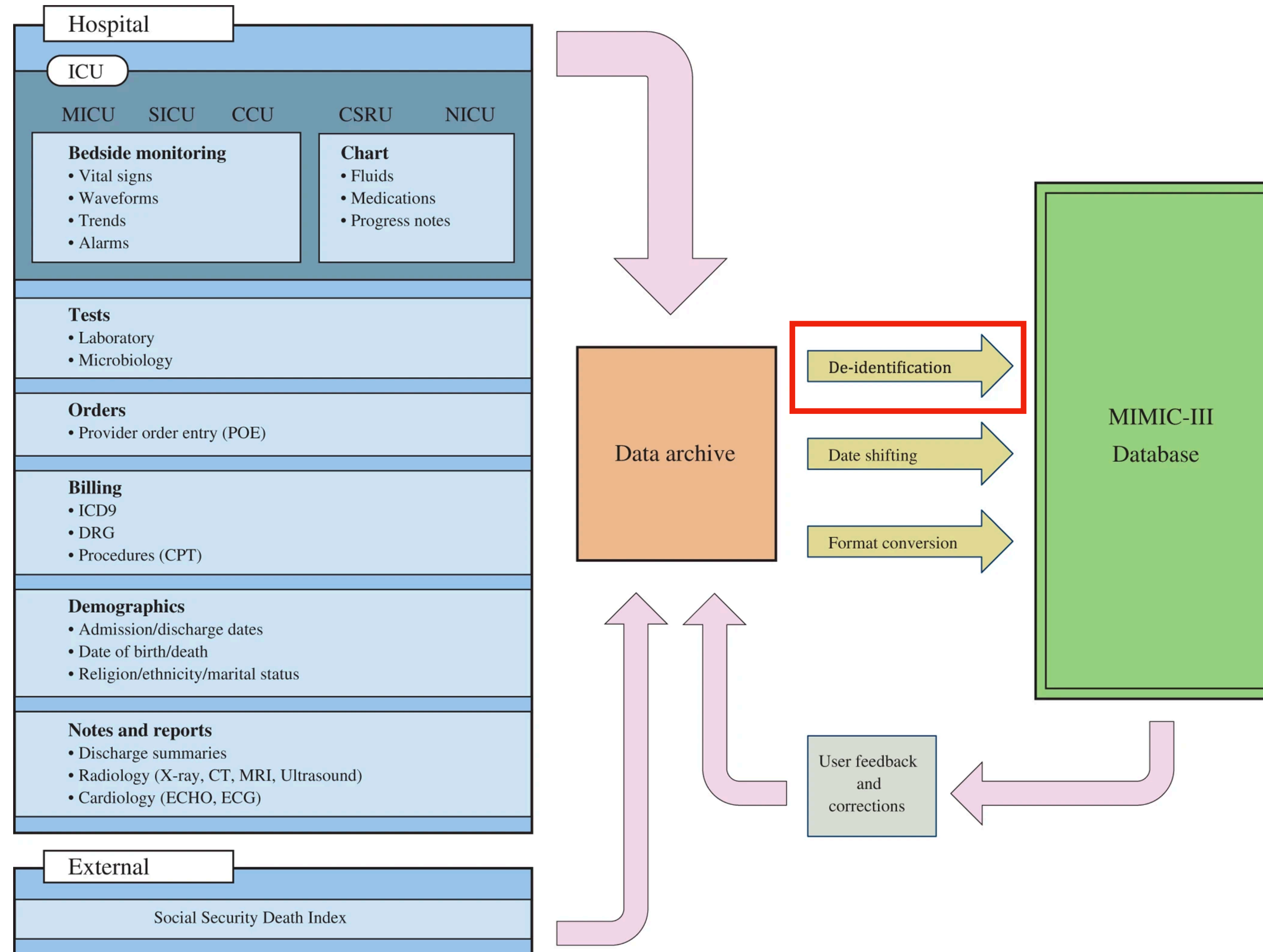




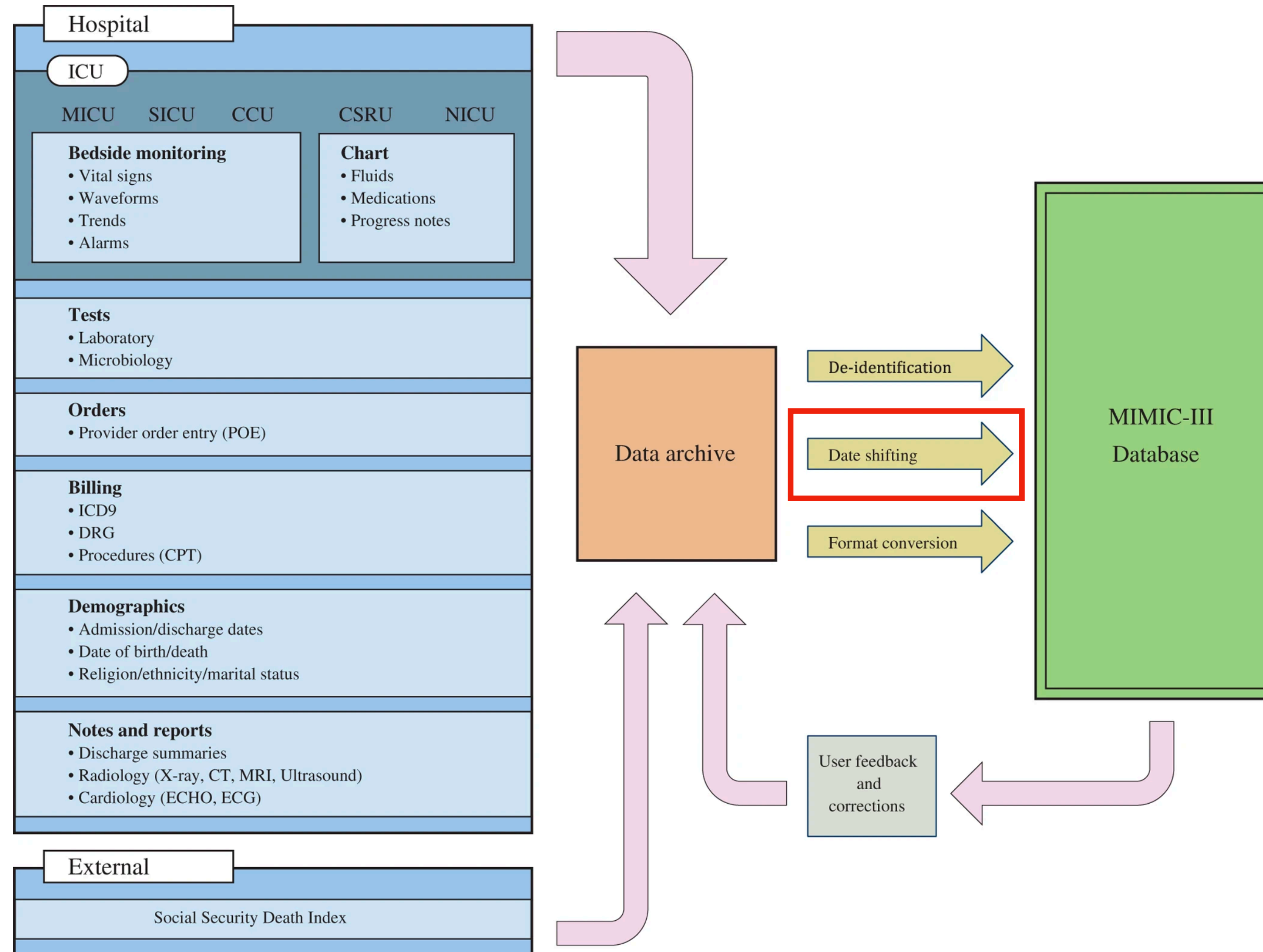
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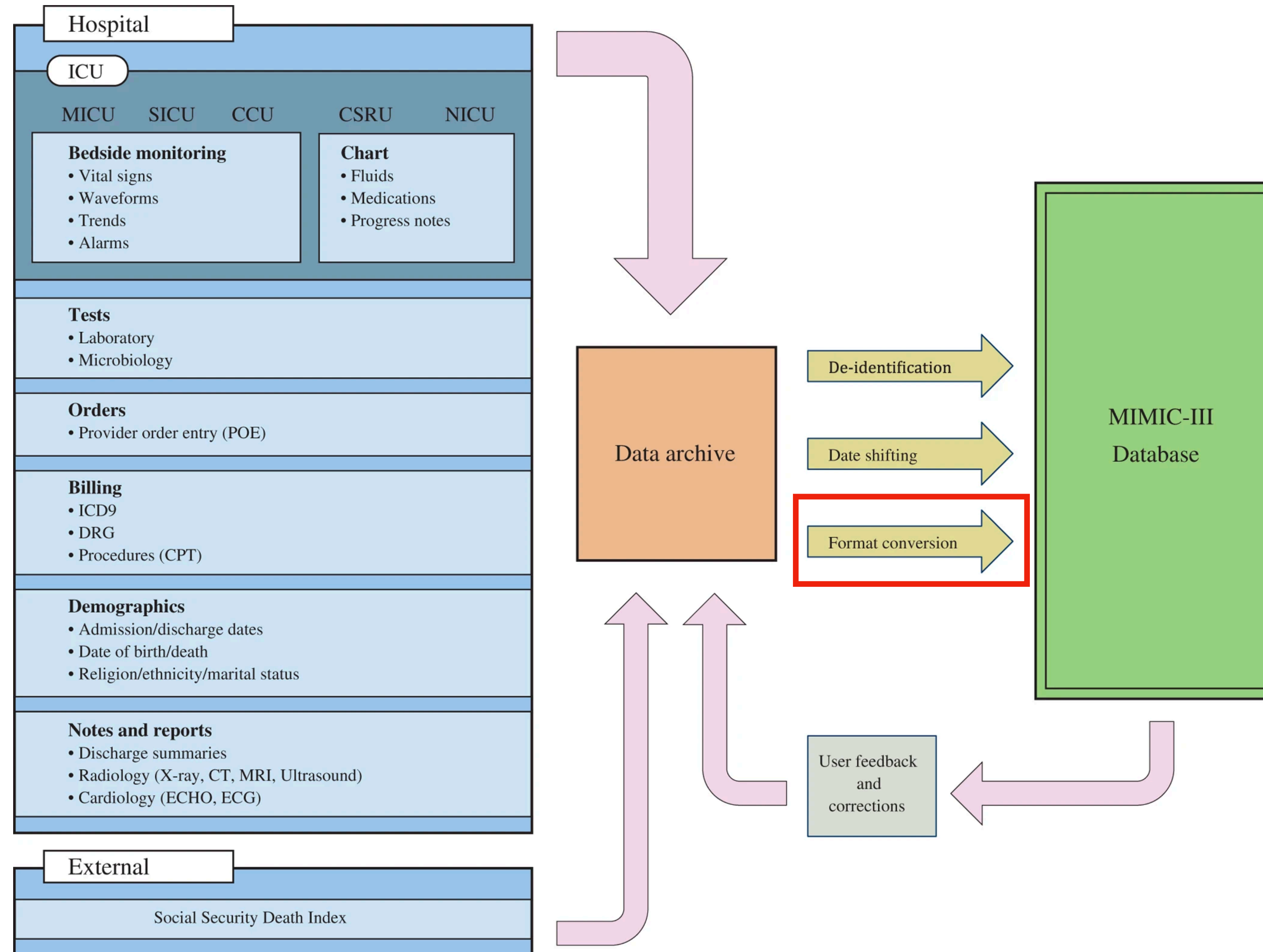


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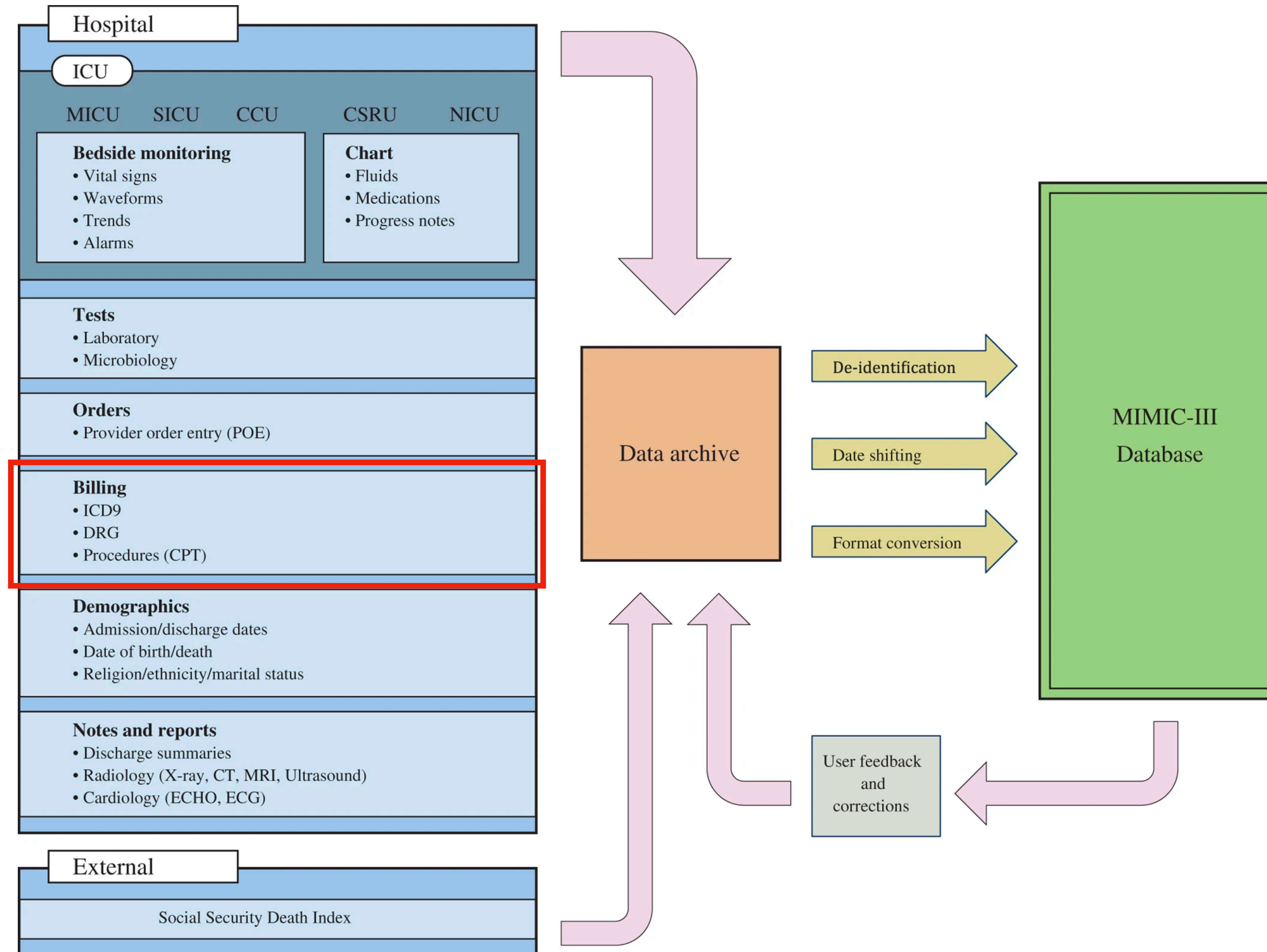




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# (a bit about the) Database Schema

Details available in: <https://mimic.physionet.org/mimictables/>

## Patient

SUBJECT_ID	GENDER	DOB	
DOD	DOD_HOSP	DOD_SSN	EXPIRE_FLAG

## Admissions

SUBJECT_ID	HADM_ID	
ADMITTIME	DISCHTIME	DEATHTIME
ADMISSION_TYPE	ADMISSION_LOCATION	
INSURANCE	LANGUAGE	RELIGION
MARITAL_STATUS	ETHNICITY	
EDREGTIME	EDOUTTIME	DIAGNOSIS
HOSPITAL_EXPIRE_FLAG		

## ICU Stays

SUBJECT_ID	HADM_ID	ICUSTAY_ID
DBSOURCE		
FIRST_CAREUNIT	LAST_CAREUNIT	
FIRST_WARDID	LAST_WARDID	
INTIME	OUTTIME	LOS

# Important to know





# Some relevant tables

Diagnoses\_ICD

Procedures\_ICD

SUBJECT\_ID , HADM\_ID    SEQ\_NUM  
ICD9\_CODE

Labevents

SUBJECT\_ID , HADM\_ID    ITEMID  
CHARTTIME    VALUE , VALUENUM  
VALUEUOM    FLAG

Mircobiology  
Events

SUBJECT\_ID , HADM\_ID  
CHARTDATE , CHARTTIME  
SPEC\_ITEMID , SPEC\_TYPE\_DESC  
ORG\_ITEMID , ORG\_NAME    ISOLATE\_NUM  
AB\_ITEMID , AB\_NAME  
DILUTION TEXT , DILUTION\_COMPARISON ,  
DILUTION\_VALUE  
INTERPRETATION

Prescriptions

SUBJECT\_ID , HADM\_ID , ICUSTAY\_ID  
STARTDATE , ENDDATE    DRUG\_TYPE  
DRUG , DRUG NAME POE ,  
DRUG\_NAME\_GENERIC  
FORMULARY\_DRUG\_CD , GSN , NDC  
PROD\_STRENGTH  
DOSE\_VAL\_RX , DOSE\_UNIT\_RX  
FORM\_VAL\_DISP , FORM\_UNIT\_DISP    ROUTE

# Codes and Descriptions

diagnoses\_ICD

d\_diagnoses\_icd

row_id [PK] integer	subject_id integer	hadm_id integer	seq_num integer	icd9_code character varying (10)
12350	1062	105525	1	85200
12351	1062	105525	2	43491
12352	1062	105525	3	0389
12353	1062	105525	4	51881
12354	1062	105525	5	2639
12355	1062	105525	6	48283
12356	1062	105525	7	99592

	row_id [PK] integer	icd9_code character varying (10)	short_title character varying (50)	long_title character varying (255)
1	174	01166	TB pneumonia-oth test	Tuberculous pneumonia [any f...
2	175	01170	TB pneumothorax-unspec	Tuberculous pneumothorax, u...
3	176	01171	TB pneumothorax-no exam	Tuberculous pneumothorax, b...
4	177	01172	TB pneumothorx-exam unkn	Tuberculous pneumothorax, b...
5	178	01173	TB pneumothorax-micro dx	Tuberculous pneumothorax, t...
6	179	01174	TB pneumothorax-cult dx	Tuberculous pneumothorax, t...

	row_id integer	subject_id integer	hadm_id integer	seq_num integer	icd9_code character varying (10)	row_id integer	icd9_code character varying (10)	short_title character varying (50)	long_title character varying (255)
1	12350	1062	105525	1	85200	8394	85200	Traum subarachnoid hem	Subarachnoid hemorrhage foll...
2	12351	1062	105525	2	43491	5053	43491	Crbl art ocl NOS w infrc	Cerebral artery occlusion, uns...
3	12352	1062	105525	3	0389	660	0389	Septicemia NOS	Unspecified septicemia
4	12353	1062	105525	4	51881	5279	51881	Acute respiratry failure	Acute respiratory failure
5	12354	1062	105525	5	2639	1642	2639	Protein-cal malnutr NOS	Unspecified protein-calorie m...
6	12355	1062	105525	6	48283	5514	48283	Pneumo-oth-gram-neg-bact	Pneumonia due to other gram...

The same happens with procedures, labs, chartevents, inputevents, and others



# Some issues with time

- Dates are anonymized, that's why you see Star Trek years
- Dates are consistent **within** patients, **not between** patients
- Some elements are generated at the END of a hospitalization (Diagnoses, Procedures, DRGs)

# Accessing the data

- Request access on Physionet
  - Complete CITI training
  - Request access, you have to explain why you are requesting the dataset
- Once you get access, you can:
  - Download the data and create your own instance of the database
  - Access it through QueryBuilder
  - Access it through Google Big Query