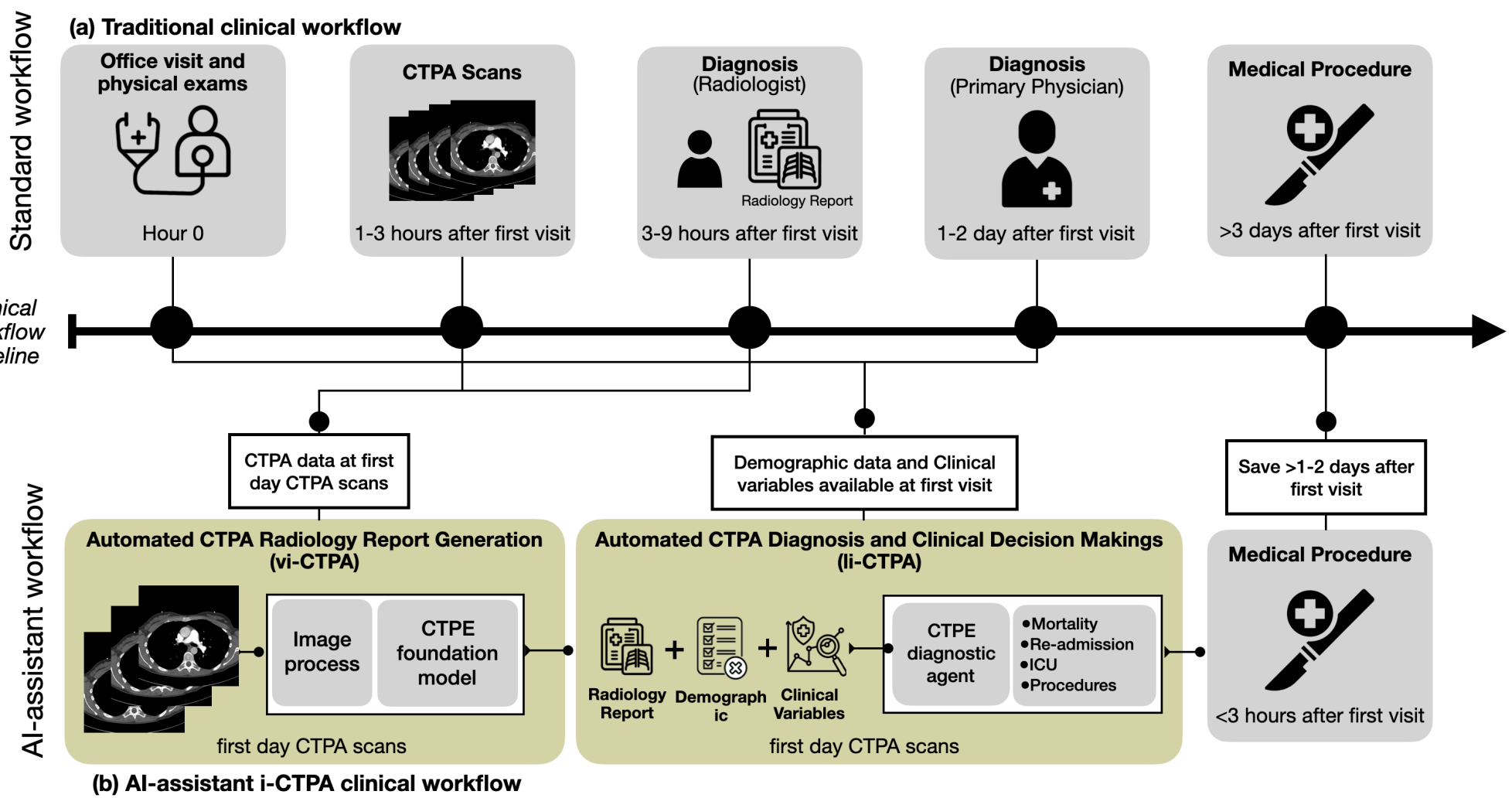
(a) Traditional clinical workflow
Standard workflow
Office visit and physical exams
Hour 0
CTPA Scans
1-3 hours after first visit
Diagnosis (Radiologist)
Radiology Report
3-9 hours after first visit
Diagnosis (Primary Physician)
1-2 day after first visit
Medical Procedure
>3 days after first visit
Clinical workflow timeline
CTPA data at first day CTPA scans
Demographic data and Clinical variables available at first visit
Save >1-2 days after first visit
AI-assistant workflow
Automated CTPA Radiology Report Generation (vi-CTPA)
Image process
CTPE foundation model
first day CTPA scans
Automated CTPA Diagnosis and Clinical Decision Makings (li-CTPA)
Radiology Report
Demographic
Clinical Variables
CTPE diagnostic agent
•Mortality
•Re-admission
•ICU
•Procedures
first day CTPA scans
Medical Procedure
<3 hours after first visit
(b) AI-assistant i-CTPA clinical workflow
Stage 1: Cohort Collection Study
Four hospitals from US and China (n=23,942)
Explore the models' generalizability
Stage 2: VLM (vi-CTPA) Development and Assessment
CTPA Agent
Radiology Report
Report Accuracy
Explore the feasibility and accuracy of CTPA report generation
Stage 3: Reader Study
Report from AI
Original report
Which one is better?
[ ] Report 1
[V] Report 2
[ ] Neither
Explore the feasibility of assisting radiologist
Stage 4: LLM (li-CTPA) Deployment and Assessment
CTPA Agent on clinical info
Compare
DL model on clinical info
Four hospitals for mortality and readmission studies (n=19,457)
Three hospitals for ICU admission (n=16,333)
Two hospital for procedures (n=14,984)
(c) Four stages of implement of AI-assistance i-CTPA clinical workflow