

How smartphones transform healthcare

More than 1.2 million people living in London are to be offered medical diagnosis using Babylon — an “artificial intelligence” (AI) app which gives patients access to a virtual health service in their pocket



Babylon: Free app enables patient to talk to a doctor via live video chat.

Check a symptom feature gives automated diagnosis from anywhere in world, using highly accurate AI triage service

iExaminer: Hand-held ophthalmoscope uses iPhone camera to capture high-resolution pictures of back of eye. Field-of-view is five times larger than traditional ophthalmoscope and does not require dilation



of pupil. App allows image and text to be sent from remote locations to specialist

Kardia Mobile: Blood pressure monitor and electrocardiogram (ECG) detects **hypertension** and **atrial fibrillation (AF)** from patient's fingertips. App relays data to doctor.

High blood pressure among patients with AF is associated with 50% increase in risk of stroke



SpiroSmart: App uses microphone as sensor in smartphone-based spirometer to monitor chronic lung ailments such as **asthma**, **cystic fibrosis** and **chronic bronchitis**. App analyses sound wave frequencies in patient's trachea and vocal tract



PoopMD: Free app reads stool colour to identify **biliary atresia (BA)** — disorder which causes paediatric liver disease.

BA is most common in East Asia, with incidence of one in 5,000 live births. If left untreated BA can lead to liver failure

CliniCloud: Includes digital stethoscope and thermometer — two essential tools of doctor's clinic.

Both work with phone app to record and analyse temperature, heart rate and respiratory readings. Data can be sent directly to physician



Biomeme System: Turns an iPhone into mobile DNA laboratory. Hand-held real-time PCR* thermocycler works by creating billions of copies of pathogen's DNA in patient's blood sample and tagging them with fluorescent dye.

*polymerase chain reaction



iPhone's camera can then detect glowing dye, while app identifies which virus is present in sample



Lumify: Philips ultrasound system plugs into Android tablet or phone.

Scanning app enables imaging of lungs, abdomen, musculoskeletal and soft tissue structures.

App allows ultrasound scan — performed at urgent care centre — to be sent directly to radiologist at hospital for expert evaluation



2013-16 Ebola outbreak:

More than 28,600 cases and over 11,300 deaths occurred during West African epidemic of Ebola virus.

Real-time PCR was used to identify virus, but few tests were applied in the field. Biomeme PCR could screen someone in less than two hours from a single finger prick