



### Business challenge

As strokes and other cerebrovascular diseases have grown more commonplace in the general public, the Chinese medical industry needed a more effective way to screen for and treat these illnesses.

### Transformation

IBM Business Partner Shanghai Changjiang Science and Technology Development used IBM® Watson® technology to build an AI-based medical assessment platform that can analyze existing medical records to categorize patients based on their risk of experiencing a stroke and that can predict the success rate of different treatment plans.

### Results

#### 15% improvement

in diagnostic accuracy for patients' stroke risks

#### 80.89% accuracy

when predicting treatment outcomes

#### Expands risk screenings

to cover larger sections of the population, encouraging earlier treatment

# Shanghai Changjiang Science and Technology Development Co. Ltd.

## Harnessing the power of AI to prevent strokes and build a healthier China

IBM Business Partner [Shanghai Changjiang Science and Technology Development](#) is a wholly-owned subsidiary of China Electronics Technology Group Corp. Founded in 2002, the organization specializes in offering cognitive, cloud-based computing solutions to the medical community.

*“By working with IBM, we were able to harness the power of AI to deliver better care to patients throughout the treatment process.”*

— Zhang YuYu, General Manager, IBM Business Partner Shanghai Changjiang Science and Technology Development Co. Ltd.

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## Promoting public health

Over the past several years, cardiovascular and cerebrovascular diseases have grown in frequency in China, becoming one of the leading causes of death and disability in the nation. To address this threat, the Central Committee of the Communist Party of China launched its “Healthy China 2020” plan, which aimed to improve the management of chronic diseases for the population while strengthening the quality and delivery model for medical and health services.

As medical professionals examined how to best treat strokes and related medical complications, they identified three key areas of focus: accurate screenings, precise treatments and meticulous rehabilitation.

Traditionally, medical institutions relied on manually filled-in paperwork to try to screen patients for risk factors associated with strokes. But these efforts only reached a small cross-section of the population, and

medical professionals found it difficult to identify and target high-risk groups for prevention efforts.

Information surrounding treatments and rehabilitation plans was equally segmented. Physicians could routinely research only the details regarding specific procedures, lacking visibility into the potential success or long-term impact that a treatment method might have on a patient’s health. Doctors were forced to make predictions based on their personal experience rather than hard data. And as patients and their families struggled to locate answers regarding recovery times and other concerns, hospitals found it difficult to gain patients’ confidence and cooperation.

## Finding a better treatment

In 2017, IBM Business Partner Shanghai Changjiang Science and Technology Development joined with IBM and the neurology departments of three top Chinese hospitals to develop an intelligent stroke assessment and management platform. Ideally, this new system

would harness the power of AI to identify those with a high stroke risk and oversee the entire treatment lifecycle, from diagnosis to treatment to rehabilitative follow-up.

Now, as medical centers and hospitals add new patient information, an embedded screening model, built with IBM Watson Studio technology, analyzes the record along with any existing information—exam histories, chemical tests, bloodwork—comparing these details against known risk factors. If a patient is diagnosed as being at a heightened level of risk for stroke, the system notifies the appropriate physician, offering treatment recommendations based on their likelihood of success.

Even better, as physicians continue to import patient records as well as treatment outcomes, the predictive algorithms will be able to employ iterative deep learning, improving the likelihood of a successful treatment plan.

The analytics framework was encapsulated into a standard web service, which uses the IBM API

Connect® solution to enable simplified integration into hospital and other medical systems. Shanghai Changjiang Science and Technology Development also used the IBM technology to create a self-service portal for its app development team to streamline the development process.

And with greater access to the necessary APIs, the business extended the reach of the solution even further. By creating a mobile app that would let the general public conduct stroke screenings on their own, Shanghai Changjiang Science and Technology Development empowers patients to evaluate and recognize their own risk levels. For patients facing increased risk, the app can offer supplemental medical information and even identify appropriate insurance offerings.

To encourage the broad use of the stroke assessment platform, IBM and Shanghai Changjiang Science and Technology Development designed the solution to be available through both public and private cloud delivery models.

## Encouraging a healthier tomorrow

With the new solution in place, patients are now much better informed regarding their potential risks; and medical personnel—or patients themselves—can now screen a larger volume of people in a shorter time. As a result, previously unreachable cross-sections of the general population are being evaluated, enabling them to act before a stroke can occur. Even better, the analytics capabilities of the Watson-based platform generate diagnostic results that are 15 percent more accurate in predicting a given patient's risk levels compared to the more subjective methods previously used.

The solution also equips hospitals to research and develop new treatment plans and rehabilitation regimens that are data-driven and that focus on proven results. And physicians can make targeted treatment recommendations based on a patient's personal medical history and related factors. After tracking care outcomes at one hospital over the first six months of the project, the Watson-based solution was able to predict rehabilitation success with an 80.89 percent accuracy. And as more data is fed to the system, these predictions will likely grow more accurate.

Overall, both Shanghai Changjiang Science and Technology Development and the associated

hospitals were pleased with their choice of IBM technology to support the solution. The Watson Studio offering provided an easy-to-use platform that could readily integrate with multiple platforms, ending data isolation. And by employing API Connect technology, the business could more easily distribute the solution to a broader range of hospitals and care facilities, promoting greater medical outcomes across China. "By working with IBM, we were able to harness the power of AI to deliver better care to patients throughout the treatment process," says Zhang YuYu, General Manager at Shanghai Changjiang Science and Technology Development.

### Solution components

- IBM® API Connect®
- IBM Watson® Studio

#### Take the next step

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