



## Medi-Span Clinical proves to be an important aid for achieving HIMSS certification for CMUH

To ride on the digitalisation trend, raise the level of medical care, and connect with the international community, in April 2017 China Medical University Hospital (CMUH) in Taiwan accepted HIMSS' (the Healthcare Information Management and Systems Society) assessment for Electronic Medical Record Adoption Model (EMRAM) and obtained Stage 6 certification.

At the direction of CMUH Director Zhou Deyang, Dr. Pai Peiyong, the hospital's Director of General Internal Medicine, Chairman of the Medical Committee and Deputy Director of the Teaching Department, played a key role in facilitating the assessment process. Dr. Pai, who is also responsible for projects such as structuring of hospital medical records and system optimisation, saw opportunities for the hospital beyond the Stage 6 certification, both in terms of further accreditations and improvements in patient safety processes. What his organization needed was a sophisticated drug data solution that helped with alert management.

"The introduction of Medi-Span® Clinical improved our closed-loop medication management, thus assisting us to achieve HIMSS EMRAM Stage 7 certification," Dr Pai said.



**Medi-Span Clinical provides "a dedicated editorial team responsible for data collection, organisation, and review, as well as system updates. These are features that local hospitals, with relatively limited IT staff and busy pharmacists, cannot match."**

Dr. Pai Peiyong, Director of General Internal Medicine  
China Medical University Hospital (CMUH)

### The role of Medi-Span Clinical in achieving advanced EMR/EHR capabilities

In early December 2019, after another three-day intensive evaluation, CMUH became the second medical centre in Taiwan and the first in central Taiwan to achieve Stage 7 of HIMSS EMRAM certification. This is the highest level of accreditation HIMSS offers, and it certifies that CMUH has achieved maturity in information security, closed-loop management of medical operations, smart management, and clinical decision-making system, which can safeguard patient safety.

"After passing HIMSS EMRAM Stage 6, the assessment report identified areas that needed to be improved, which were mainly system-related issues," said Dr Pai. "By 'system-related issues,' they are generally referring to establishment and optimisation of digital information-based systems. But HIMSS' focus is actually on how the hospital can improve the flow of information and cut staff workload to reduce human error, improve the quality of care and patient safety."

To address these issues, after referencing proposals from different vendors, CMUH decided to adopt Medi-Span Clinical. Medi-Span Clinical is data-rich, fully functional, and meets HIMSS certification requirements as well as those of the hospital for system optimisation.

## Considerations for adopting Medi-Span Clinical

Initially, there was interest in having the hospital build its own information system.

“At the beginning, everything was relatively simple: Medical units will explain their requirements to the IT team, who will build the corresponding system,” Dr. Pai recalled. “But as the system became more complex, functionalities began to overlap. Subsequent requirements were sometimes not met, so as not to conflict with existing functionalities. Coupled with the shortage of IT staff and busy clinician schedules, issues began to occur with in-house development.”

CMUH had planned construction of a thorough drug screening system, complete with alerting mechanisms that included drug interaction, drug allergy, drug-food interaction, dosing range, prescription duplication, cumulative dose, and other contraindications. However, it was hard to manage with existing staffing resources. After considering many different solutions, the final decision was made to introduce Medi-Span Clinical from Wolters Kluwer.

“After passing HIMSS EMRAM Stage 6, we realised the need to look externally, and found Medi-Span Clinical through the pharmacy department. We spent a lot of time evaluating it, and another year to fully integrate it with our existing system,” Dr. Pai said.

“Medi-Span Clinical is the best solution to meet the original plan framework,” Dr. Pai pointed out. “Including the interactions between drug-to-drug, allergies or food, Medi-Span Clinical’s global database is very exhaustive. There is a dedicated editorial team responsible for data collection, organisation, and review, as well as system updates. These are features that local hospitals, with relatively limited IT staff and busy pharmacists, cannot match.”

hospital database with that of Medi-Span Clinical, to compare the hospital’s existing domestic drug information with Medi-Span Clinical’s database. This allows us to obtain more complete information and further reduce risk.”

## Better alert management to reduce ‘fatigue’

After aligning Medi-Span Clinical’s extensive global drug database with the hospital’s drug list, Dr. Pai noted that the second and possibly most important step of CMUH’s implementation was alert management. “We simplified the alert system to reduce the more general and less serious drug warnings, so as to prevent alert fatigue from affecting clinicians’ work.”

Many new medical devices, such as computerised physician order entry (CPOE), smart intravenous pumps or heart monitoring devices, now provide clinicians with auditory or visual warnings to prevent and respond to safety risks. However, a 2014 study showed that in a university hospital, physiology monitors in 66 adult intensive care units generated more than 2 million alerts in a month, equivalent to [187 warnings per patient per day](#). Clinicians are constantly bombarded by a large number of “noisy” alerts, unintentionally leading to the issue of “alert fatigue” and desensitising them to critical safety alerts they should not ignore.

While it is true that some warnings are clinically insignificant, clinicians desensitised to alerts are likely to ignore both informational alerts and emergency alerts that might prevent patient harm along with the less urgent ones. This increases the likelihood of patient harm.

Therefore, it is important that advanced clinical systems can flexibly adapt to the needs of clinicians.



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Implementing Medi-Span Clinical enabled CMUH to advance its accreditations. “After achieving HIMSS EMRAM Stage 7, we continuously worked with the Wolters Kluwer team to enhance and optimise the system,” Dr. Pai said. “Firstly, we integrated the original

As the Medi-Span Clinical database contains an extensive set of medication scenarios, there’s a potential of frequent medication alerts, something that pharmacists found distracting.

CMUH's IT team and pharmacists actively communicated with the Wolters Kluwer expert implementation team, adjusting and simplifying the system adjustments to leave only the more severe and meaningful drug screening alerts and cut down the frequency of warnings. This reduced the clinicians' alert fatigue.

At the same time, Wolters Kluwer stepped up efforts to communicate the benefits of Medi-Span Clinical in reducing medication risks, assuring clinicians that only highly relevant alerts are given. These efforts paid off and clinicians gradually trusted the system and adapted to the new workflow.

### Closing the medication loop

"Most importantly, Medi-Span Clinical assisted us in completing close-loop medication management. HIMSS's assessment for closed-loop medication management requires the use of automation throughout the process, from the doctor's prescription, pharmacist's validation and finally nurse's issuance of drugs, which will reduce the possibility of errors in any of those steps," said Dr. Pai solemnly. "The role of Medi-Span Clinical, in addition to issuing alerts to the relevant medical personnel at any step of the process, was also to allow personnel to communicate with each other online with records of multi-party communications captured."

This is important, as sometimes there is inevitably contention between the doctor's prescription and the pharmacist's review. In general, doctors should receive an alert when they write a prescription and Medi-Span Clinical screens for a potential issue. But apart from the most obvious drug conflicts indicating that the prescription should never be written for that particular patient, the system will not prevent doctors from prescribing most drugs. Therefore, if the physician insists, the prescription will be written and sent for review. The prescriptions will then be sent to the reviewing pharmacist, who will also receive the warning.

Although pharmacists are medication professionals, they are not specialists and are not necessarily familiar with all medications. So, when they receive a prescription with a warning, they need to communicate with the prescriber. At this point, there are two scenarios: In most cases, Medi-Span Clinical allows pharmacists to respond directly via the system to the doctor. However, if the situation is urgent, the pharmacist may also call the doctor directly to communicate and note down the call outcomes in the system.

## Considering future system optimisation

*There is always opportunity to optimise hospital systems, and Dr. Pai Peiyong of CMUH has a vision of what the future of clinical decision support could look like in Taiwan and worldwide.*

*"Most of the systems introduced now provide information for medical staff to refer to. But we hope that in the future we can strengthen the systems to provide treatment advice proactively," he said.*

*Some advanced clinical decision support systems used outside of Taiwan automatically capture medical reports written by physicians, and then based on algorithms, suggest possible causes and the next examination or treatment to be done. Rather than playing a leading role, the system provides physicians with more comprehensive considerations to inform decision making.*

*Even the more advanced systems available today can only manage one or two simple disease diagnoses and are unable to simultaneously take into account the possibility of a variety of diseases like a clinician can. Nonetheless, in the spirit of caring for patients as if they are family, Dr. Pai stressed that the direction of system optimisation is based on maximising well-being of patients. He looks forward to a breakthrough in the near future which will bring a new dawn to the medical field.*

"If phone calls are used frequently to communicate, it will interfere with physicians' work, and there is no record of the communications. There will be a lack of clarity if we were to seek accountability in the future," Dr. Pai explained. "Therefore, in accordance with HIMSS assessment, we encourage colleagues to communicate through the online system as default, so it is easy to track the whole medication process and ensure accountability."

### Advanced systems help advance capabilities

Besides assisting with closed-loop medication management, the introduction of Medi-Span Clinical had an unexpected but important benefit for the hospital: raising the capabilities of medical personnel.

There are simply too many kinds of drugs on the market today, with countless interactions between them. In the past, clinicians would often refer to the pharmacopeia while prescribing, which took time and effort. However, after the introduction of Medi-Span Clinical, in addition to medication alerts, the system provides certain medication information such as the recommended dose. As a result, besides significantly lowering the barrier to entry for new clinicians, the system allows them to learn medical knowledge through various situations on-the-job.

Also, modern medicine presents clinicians with more known diseases than in the past, and clinical knowledge progresses faster. Clinicians

may not necessarily be aware of some new treatment methods and drug therapies, so it is important to have a database with the latest evidence and best practices which is easily accessible.

Compared to other vendors, Medi-Span Clinical's drug database is not only extensive, but it is also continuously reviewed and updated with new content. Medi-Span Clinical's data is reviewed by 7,300 clinical experts to ensure data confidence. This was one of the important considerations for CMUH when choosing Medi-Span Clinical.

With the success of Medi-Span Clinical drug data integrated into the hospital's EHR, CMUH decided to add another Wolters Kluwer solution as a companion resource and to

continued. "This aspect will be complemented by training from senior physicians. However, the database will be a great help for students who are willing to self-learn even after they leave class. So, the hospital is pleased to purchase such materials to raise the standard of its medical staff."

Dr. Pai also noted that making good use of these advanced and sound database systems will be very beneficial to the growth of Taiwan's medical institutions and talent capabilities. It would be difficult to reduce various clinical errors through one's own strength alone, he said. It is still necessary to, at times, learn from others' best practices to be able to break through restrictions and blind spots.

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expand its drug knowledge offerings for pharmacists and other clinicians.

"During this year's contract renewal process, we decided to introduce the Lexicomp® clinical pharmacy database as well, with the main aim for clinicians to further learn about drug prescriptions through more case studies," said Dr. Pai. "Besides searching for knowledge, Lexicomp also supports medication decision making. With a knowledge base that exceeds those of teachers, it will be very helpful for students who are keen to self-study.

"Of course, knowledge is useless without the ability to use it flexibly and correctly, and that depends on the users' own judgment," he

#### **About China Medical University Hospital**

Established in 1980, China Medical University Hospital (CMUH) was the first hospital in Taiwan to integrate Chinese and Western medicine. JCI-accredited since 2010, CMUH offers eight comprehensive medical specialty centers. Located in Taichung, the largest city in central Taiwan, CMUH provides medical services for international patients from all over the globe.