

S6E5 | Powering efficiency with the data manager

*with **Doctor Henry Paridaens**, Head of the Department of Clinical Biology, CHR de la Citadelle, Liege (Belgium).*

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How can data management improve efficiency in coagulation? In this Meet the Expert discussion organized by Stago at ISTH 2026, Dr Henry Paridaens explores how expert rules, auto validation and enhanced traceability can standardize laboratory workflows, support interpretation and contribute to safer patient management.

Could you share with us the laboratory pain points that you addressed with your data manager?

I have been using Stago data management solutions for more than 10 years. When I was a trainee, I used STA Coag Expert, the former Stago Data Manager software. The starting point has always been the same: worldwide, laboratories are facing increasing sample volumes while operating with reduced staff and limited resources. On top of that, accreditation requirements and ISO standards encourage the standardization of the entire process, from the pre-analytical phase to the final comment provided to the clinician.

In coagulation, expertise is often concentrated in the minds of a few experienced technologists and clinical biologists. While this knowledge is essential, it may lack traceability and consistency, and at 3:00 a.m. on a Sunday morning, it may simply not be available. One of the first challenges that STA Coag Expert, and more recently

sthemE Manager, helped us address was transferring this expertise from the heads of clinical biologists into auditable and actionable expert rules.

Another key role of the data manager is the verification of pre-analytical quality indicators, such as fill volume, clot detection, icterus, hemolysis, and other potential interferences.

For me, the most important contribution of both STA Coag Expert and sthemE Manager is the support they provide for creating and maintaining expert rules. Trying to build expert rules directly within a conventional Laboratory Information System (LIS) is often cumbersome. It is a difficult task because LIS platforms tend to be rigid and slow to modify, and they usually require support from the IT department. With STA Coag Expert, rule creation was generally manageable. As a trainee, I spent many days writing rules for both routine and specialized coagulation testing, and it was entirely feasible. Today, with sthemE Manager, the process is even easier. Clinical biologists like myself can create and maintain these rules independently, without requiring extensive IT support. For us, the main benefit and added value of the system has been its ability to transform laboratory expertise into expert rules. This allows me to focus only on clinically relevant and challenging cases instead of spending time reviewing the approximately 85% of patients whose coagulation results are within normal limits.

When we meet customers and laboratory users, they often feel that writing expert rules is difficult. Do you have a secret recipe to streamline the rule creation process?

A good chef never shares his recipe! But, I can share some practical advice regarding algorithm design.

The first thing is that I do not start with the Data Manager software. In fact, I spend little to no time on the software at the beginning. Instead, I take a pen and a sheet of paper and write down the entire decision tree. I carefully think through every step, every branch, and every interaction between tests, previous results, medications, and all the other factors that may influence interpretation. Because a coagulation test does not exist in isolation. An APTT ratio, for example, must be interpreted in the context of the patient's treatment, clinical situation, previous results, other coagulation parameters, and potential reflex tests such as thrombin time. So, the first step is to map out every stage and every possible outcome of the algorithm before implementing it in the system.

Once this work has been completed, implementing the algorithm in the Data Manager is essentially just a transcription of what has already been designed on

paper. For example, when I was a trainee, it took me several days to create all the rules for routine coagulation testing and pre-analytical checks in STA Coag Expert. When I switched to sthemE Manager, however, it took me only 155 minutes to encode the rules, once the decision trees had been designed. I know that precisely because I timed it. Writing all the rules for APTT, fibrinogen, D-dimer, and PT was remarkably fast.

What is even more impressive is the impact this had on auto validation rates. For fibrinogen, for example, we increased the auto validation rate from around 49% to approximately 90%. For APTT ratio, it increased from about 85% to 95%. For D-dimer, the improvement was even more significant, rising from approximately 53% to 93%. So, for me, this is a perfect example of the principle: little effort, big rewards.

Those are really impressive numbers. But, you know, I feel that you are quite enthusiastic about expert rules. I suppose you had to learn a very complex and obscure IT language to write all these rules.

Even with STA Coag Expert, you needed some basic understanding of logical concepts, such as the difference between AND and OR operators. However, you did not need to learn any specific scripting language to create expert rules. It was actually quite easy to do.

Now, with sthemE Manager, it is even more intuitive. You can use visual operators and easily select elements such as previous results, current results, medications, and many others. You can then combine all these tools using a drag-and-drop interface, which makes rule creation very straightforward. So, technical complexity is not really a barrier for users. The system is easy to learn and easy to implement.

I got the laboratory benefits, but beyond those, what are the fundamental advantages of the Data Manager for patients and for physicians within your organization?

For us, one of the main benefits it helped implement is complete traceability. For example, when a clot verification is performed, we know who did it and when it was done. That has been one of the biggest advantages.

We also serve a large number of outpatients, and for family physicians and general practitioners, coagulation can be difficult to interpret. With the algorithms and expert rules, we have been able to automatically add interpretative comments to the results. As a result, the prescriber no longer receives just a raw numerical value, but also an

interpretation of the result, guidance on the next steps, and information on whether there may be a suspected interference affecting the result. A good example is the D-dimer test. We implemented age-adjusted cut-offs for VTE exclusion, with comments on whether imaging should be considered according to the clinical probability.

We have also implemented automated pre-analytical comments covering sample requirements, such as the acceptable delay between sample collection and testing, the importance of the fill volume, and medication information. When medication information is missing, we explicitly indicate that it is unavailable. From these comments and from the overall implementation of the system, we have observed improvements in our pre-analytical quality indicators for coagulation testing. Communication between the laboratory and the clinical wards has also improved. When we repeatedly indicate that anticoagulation information or other relevant clinical data are missing and prevent a proper interpretation of a specialized coagulation workup, the clinical teams tend to provide this information upfront the next time. This has been very beneficial for us.

Overall, it is a significant step in the right direction in terms of traceability. It helps ensure that data are handled as safely as possible for the patient. At the end of the day, our work is all about patient safety and appropriate patient management. The system helps us achieve that.

It's great to see the improvements you've achieved, not only within the laboratory but also in terms of awareness and communication with physicians. You've accomplished a lot with the Data Manager. Looking ahead, what would you like to see in future versions of your Data Manager?

From an ergonomics perspective, sthemE Manager is almost perfect. In that area, I think there is very little left to improve.

That being said, I will open the usual door everyone is talking about today: artificial intelligence. I think it would be extremely useful if AI could help users translate their clinical needs into expert rules and assist them in creating the rules they truly want to implement from a medical perspective.

Another area for improvement concerns the integration between hematology and coagulation. In many laboratories, these disciplines still operate on separate systems that are not ideally connected. For example, in our laboratory, we needed access to hematocrit values and had to create workarounds to retrieve them. Establishing communication between STA Coag Expert and the hematology system was quite complex. If we could have a unified platform bringing together hematology and

coagulation, I believe it would be a major step in the right direction. It would allow us to apply the same standardized philosophy and decision-making processes across all these results.

Have you been able to collect metrics to estimate the amount of time saved or to measure the improvements in efficiency?

I was able to do that when I was an intern in Bouge (Clinique Saint-Luc Bouge (Namur, Belgium). At that time, we measured the turnaround times for both the pre-validation and validation processes, and we observed a significant improvement in validation efficiency.

There was also a benefit for the technicians working during routine shifts. They hesitated less because they had a clear workflow to follow: first step, second step, third step. The expert rules provided clear guidance on what needed to be done in each situation.

We also observed improvements in reflex testing. Reflex tests were ordered less frequently and only in cases where they were truly justified and clinically useful.

Another advantage was improved communication regarding problematic cases. Technicians had the possibility to add a flag to a file whenever they encountered uncertainty. The clinical biologists could then review these specific cases afterward and focus directly on the files that required additional attention.

In Belgium, results undergo two levels of result validation: technical validation and medical validation. The most significant improvement was clearly observed in the technical validation process, particularly in terms of speed.

How do you document the rules to maintain a high level of quality assurance?

The workflow and the decision tree are, of course, documented within our quality management system. What was initially designed on paper was then uploaded into the quality system. In addition, all the rules implemented in the expert system are fully traceable. This means that you can always map any scenario back to the original decision tree and review every validation step. We validated the algorithm branch by branch using test samples to ensure that each pathway performed as expected.

As both a laboratory professional and an auditor and from an ISO 15189 perspective,

this level of traceability is exactly what a laboratory needs to demonstrate during an audit. For example, you can identify which files were automatically validated and which required manual review. You can also determine whether a test was ordered automatically by the algorithm or manually by a user. You can even see which technician verified a clot issue, for example. If a problem arises with a specific patient record, you can trace the process back and review exactly what happened. For all these reasons, it is a very valuable tool to have.

About Dr. Henry Paridaens



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