



Enhancing CT workflow efficiency and accuracy through camera-based positioning clinical results from Stepping Hill Hospital



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Our experience with the AI features on the Incisive CT have been really positive for overall examination accuracy and efficiency. The positioning camera has vastly improved the accuracy of patient positioning within the isocenter, which will have undoubtedly improved examination image quality and optimized patient dose. On top of this, the automated positioning feature allows for improved patient throughput and aided efficiency, especially when the Radiographer is working independently.

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Overview

At Stepping Hill Hospital the implementation of Precise Position, an AI-enabled camera-based positioning solution integrated in the Philips Incisive CT* system, was evaluated in routine clinical CT (computed tomography) practice. The objective was to improve both the efficiency and reproducibility of patient setup — a step known to affect quality, consistency, and throughput.

Over a five-day observational study involving 80 CT examinations, the use of Precise Position led to an average reduction in patient positioning time of 54%. At the same time, automated positioning improved centering accuracy (from 68% to 93%) and reduced the need for manual vertical adjustments (from 55% to 30%), indicating improved reproducibility.

This evaluation demonstrates that Precise Position AI-enabled camera-based workflow improves workflow efficiency and setup consistency under real-world clinical conditions, achieving the same or better results in less than half the time required for manual positioning.

*Camera-based positioning solution is available on several Philips CT systems. Contact your sales representative for more information.

Challenge

High workload is consistently reported as the leading contributor to stress and burnout among radiographers.¹ Patient positioning is an important and time-consuming part of a CT examination. Manual positioning is not only prone to intra-operator variability but also frequently results in off-centering errors exceeding 20 mm.^{2,3} In addition, manual positioning occupies valuable time that could otherwise be used to improve departmental efficiency or allow radiographers to dedicate more attention to patient comfort.

Manual setups often require vertical adjustments prior to scanning, reflecting inefficiencies and variability across operators. Sub-optimal positioning not only affects image quality and radiation dose but also contributes to workflow bottlenecks in busy CT departments leading to inconsistencies across examinations and operators. Camera-based positioning systems have shown promise in addressing these challenges.²⁻⁶ However, no real-world assessment of impact on reproducibility and enhanced patient throughput has been lacking.



Study design

To assess the clinical impact of camera-based patient positioning, a prospective observational study was conducted at Stepping Hill Hospital (Manchester, UK) over a five-day period. The study compared traditional manual positioning with automated positioning using Precise Position.

A total of 80 CT examinations were included, spanning various anatomical regions and patient demographics. Positioning was performed by experienced radiographers, alternating between manual setup (n = 40) and the camera-based workflow (n = 40), depending on system availability.

Three key aspects of the positioning process were evaluated: 1) time to surview acquisition, 2) positioning accuracy at isocenter, defined as correct alignment to the scanner isocenter in the initial surview, and 3) manual corrections needed, including adjustments to vertical position and scan plan boxes.

These parameters were assessed based on objective measurements extracted from clinical image metadata and observation forms, as well as timing data recorded during the examination workflow.

The surview accuracy was recorded as a binary measure, with "accurate" defined as correct centering without further repositioning. Vertical position and plan box adjustments were noted as yes/no fields. Surview lengths and planning field-of-view were not standardized and were set at the discretion of the radiographer in manual cases.

Statistical comparisons between the manual and camera-assisted groups were performed using paired t-tests (for time data) and chi-squared tests (for categorical adjustments and accuracy).

Results

A total of 80 CT examinations were included in the analysis: 40 performed using manual positioning and 40 with camera-based positioning (Precise Position). All scans were performed in routine clinical practice by experienced radiographers.

The average preparation time was significantly ($p < 0.001$) reduced by 54%, from 79.4 seconds

(manual positioning) to 36.8 seconds (Precise Position). Manual positioning resulted in 55% of examinations needing vertical adjustment with respect to the isocenter. With Precise Position, this was significantly reduced ($p = 0.042$) to 30% of cases needing vertical adjustments. Finally, surview accuracy significantly increased ($p = 0.012$) from 68% (manual positioning) to 93% (Precise Position).

Key findings

Patient study at Stepping Hill: Impact of Precise Position

Positioning accuracy



AI-assisted by 93%
✓ Reproducible results

Vertical adjustments



AI-assisted: 30%
✓ Fewer adjustments

Time



Improved by 54%
✓ Faster throughput

Results bases on patient study at Stepping Hill Hospital, data on file. Results may vary in other hospitals and/or circumstances.

Discussion

This study demonstrates that camera-based patient positioning with Precise Position significantly improves both efficiency and consistency in CT workflows, with an observed 54% reduction in setup time, nearly cutting setup time in half. This allows CT teams to scan more patients per day and spend more time ensuring each patient feels comfortable. In addition, automated positioning improved centering accuracy (from 68% to 93%) and reduced the need for manual vertical adjustments, suggesting a meaningful improvement in standardization and reproducibility. This helps to reduce repeat scans and therefore results in less radiation exposure, leading to faster, more precise diagnoses for patients.

In high-throughput CT environments, even modest time savings can contribute to increased scan capacity or allow more time per patient. This evaluation shows that camera-based positioning with Precise Position enhances workflow efficiency while improving reproducibility through more accurate and consistent patient alignment. By reducing manual adjustments and operator variability, it also helps lower the cognitive and physical workload for radiographers.

References

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Results from case studies are not predictive of results in other cases. Results in other cases may vary.

