# Improved Clinical Specificity of the VITROS® Anti-HCV Assay P-070

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# Conflicts of Interest

All authors are employees of Ortho Clinical Diagnostics

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# Objective

This study was designed to assess the improved clinical performance of the VITROS® Immunodiagnostic Products Anti-HCV assay (VITROS HCV) which is run on the VITROS® ECi/ECiQ Immunodiagnostic Systems, the VITROS® 3600 Immunodiagnostic System and the VITROS® 5600/XT7600 Integrated Systems. The VITROS® HCV Assay Reagent was modified to reduce non-specific binding and improve the clinical specificity of the assay without negatively impacting clinical sensitivity.

The following studies compared the clinical performance of modified VITROS HCV assay to the current VITROS HCV assay.

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# Clinical Specificity

- A total of 5259 presumed anti-HCV negative donor samples and 200 presumed anti-HCV negative hospitalized patient samples were assessed in this study using one of each of the following systems: VITROS 3600 and ECi/ECiQ Immunodiagnostic Systems and VITROS 5600 and 7600 Integrated Systems. Each system used one lot of the current and one lot of the modified VITROS HCV assay and tested approximately one fourth of the total samples. A total of 8 random donor samples were reactive on the modified VITROS HCV assay and 25, including the same 8 donors as the modified assay, were reactive on the current VITROS HCV assay and all samples were confirmed to be nonreactive using another assay as a confirmatory method. All 200 hospitalized patient samples were interpreted as nonreactive on both the VITROS Anti-HCV assay and the modified VITROS Anti-HCV assay.
- A significant improvement in specificity was observed for the blood donor samples with the resulting **clinical specificity for the current assay of 99.52 (95% CI: 99.30-99.69) and for the modified assay of 99.85 (95% CI: 99.70-99.93).** Hospitalized patient samples showed 100% for both assays.

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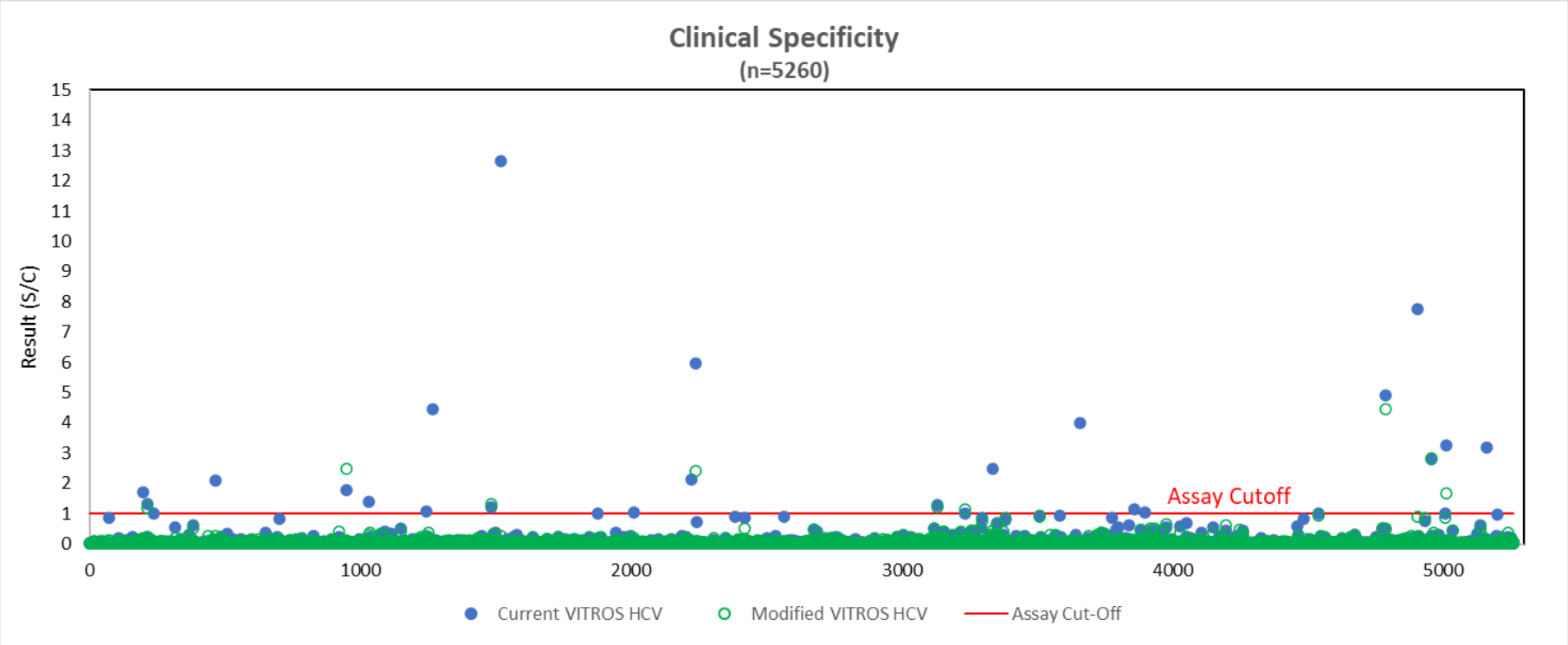
# Clinical Specificity

| | Current VITROS HCV | Modified VITROS HCV |
|---|---|---|
| Total Number | 5260 | 5260 |
| Reactive | 25 | 8 |
| Nonreactive | 5235 | 5252 |
| **Specificity** | **99.52** | **99.85** |
| 95% Exact CI | 99.30 to 99.69 | 99.70 to 99.93 |





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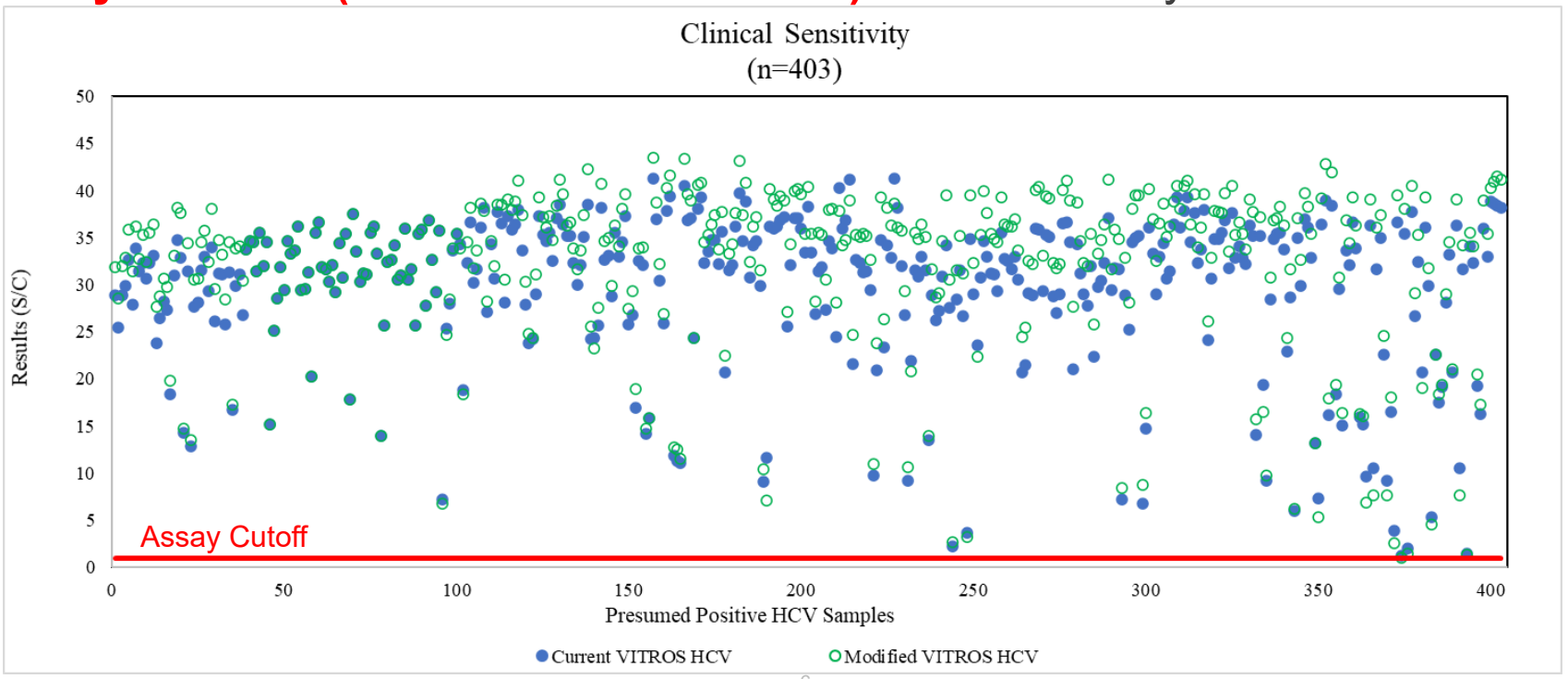
# Clinical Sensitivity

## Presumed Positive Samples

- A total of 403 presumed anti-HCV positive samples were assessed using one of each of the following systems: VITROS 3600 and ECi/ECiQ Immunodiagnostic Systems and VITROS 5600 and 7600 Integrated Systems. Each system used one current VITROS HCV and one modified VITROS HCV lot and tested approximately one fourth of the total samples. All 403 samples were interpreted as reactive on both the current VITROS HCV assay and the modified VITROS HCV assay for observed **clinical sensitivity of 100% (95% CI:  99.1 to 100%)** for both assays.



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# Clinical Sensitivity

## Seroconversion Panels

- Twenty Seroconversion panels were tested with both the current VITROS HCV and the modified VITROS HCV assays. This panel of human plasma samples demonstrates a change in response from negative to positive for HCV antibody during the development and progression of an HCV infection. The two assay detected all panels within one bleed of each other demonstrating equivalent clinical sensitivity.

| | | Number of Reactive Panel Members | | Days to First reactive Result | | Difference in Days to First Reactive result |
|---|---|---|---|---|---|---|
| Panel ID | Panel Members | Current VITROS HCV | Modified VITROS HCV | Current VITROS HCV | Modified VITROS HCV | Current HCV minus Modified HCV |
| HCV10013 | 10 | 1 | 0 | 67 | NA | NA |
| HCV10017 | 16 | 1 | 1 | 67 | 67 | 0 |
| HCV10057 | 7 | 2 | 2 | 152 | 152 | 0 |
| HCV10062 | 8 | 2 | 2 | 41 | 41 | 0 |
| HCV10071 | 7 | 5 | 5 | 77 | 77 | 0 |
| HCV10165 | 9 | 5 | 4 | 19 | 24 | **-5** |
| HCV10185 | 5 | 4 | 4 | 130 | 130 | 0 |
| HCV10235 | 5 | 3 | 3 | 96 | 96 | 0 |
| HCV6222 | 8 | 1 | 1 | 40 | 40 | 0 |
| HCV6224 | 6 | 1 | 2 | 22 | 19 | **3** |
| HCV6226 | 12 | 4 | 3 | 37 | 39 | **-2** |
| HCV6227 | 7 | 2 | 2 | 74 | 74 | 0 |
| HCV6228 | 12 | 3 | 3 | 31 | 31 | 0 |
| HCV6229 | 8 | 2 | 3 | 24 | 22 | **2** |
| HCV9041 | 8 | 4 | 4 | 62 | 62 | 0 |
| HCV9044 | 6 | 2 | 2 | 22 | 22 | 0 |
| HCV9045 | 8 | 1 | 2 | 41 | 37 | **4** |
| HCV9046 | 5 | 4 | 4 | 76 | 76 | 0 |
| HCV9054 | 10 | 2 | 2 | 77 | 77 | 0 |
| HCV9058 | 5 | 2 | 2 | 10 | 10 | 0 |



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# Precision

- Two replicates of each of five precision fluids were run on two occasions per day, separated by at least two hours, on 20 non-consecutive days spanning 29 calendar days. Testing was performed using one of each of the following systems: VITROS 3600 and ECi/ECiQ Immunodiagnostic Systems and VITROS 5600 and 7600 Integrated Systems with three reagent lots of the modified VITROS HCV assay. Within-lab precision included five calibrations. Representative data is shown below.

| Panel Member | VITROS System | Mean (S/C) | Within-run | | Within-calibration | | Within-lab | | No. Observations | No. Days |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | SD | %CV | SD | %CV | SD | %CV | | |
| PP1 | VITROS ECi | 0.93 | 0.072 | 7.81 | 0.090 | 9.76 | 0.114 | 9.98 | 84 | 21 |
| PP2 | | 2.18 | 0.145 | 6.69 | 0.186 | 8.58 | 0.242 | 6.94 | 84 | 21 |
| PP3 | | 5.01 | 0.276 | 5.53 | 0.359 | 7.20 | 0.507 | 8.10 | 84 | 21 |
| PP4 | | 0.04 | 0.006 | NA | 0.011 | NA | 0.001 | NA | 84 | 21 |
| PP5 | | 5.00 | 0.355 | 7.14 | 0.422 | 8.48 | 0.528 | 5.14 | 84 | 21 |
| PP1 | VITROS 3600 | 0.88 | 0.025 | 2.79 | 0.050 | 5.57 | 0.055 | 6.35 | 88 | 22 |
| PP2 | | 2.12 | 0.059 | 2.74 | 0.120 | 5.57 | 0.132 | 6.34 | 88 | 22 |
| PP3 | | 5.13 | 0.096 | 1.84 | 0.241 | 4.62 | 0.296 | 5.87 | 88 | 22 |
| PP4 | | 0.03 | 0.002 | NA | 0.003 | NA | 0.003 | NA | 88 | 22 |
| PP5 | | 4.83 | 0.145 | 2.95 | 0.304 | 6.19 | 0.356 | 7.50 | 88 | 22 |
| PP1 | VITROS 5600 | 0.86 | 0.022 | 2.65 | 0.042 | 5.06 | 0.051 | 5.79 | 88 | 22 |
| PP2 | | 2.05 | 0.055 | 2.76 | 0.096 | 4.81 | 0.119 | 5.63 | 88 | 22 |
| PP3 | | 5.00 | 0.072 | 1.48 | 0.178 | 3.67 | 0.242 | 4.70 | 88 | 22 |
| PP4 | | 0.03 | 0.002 | NA | 0.003 | NA | 0.003 | NA | 88 | 22 |
| PP5 | | 4.67 | 0.108 | 2.38 | 0.216 | 4.77 | 0.278 | 5.78 | 88 | 22 |
| PP1 | VITROS 7600 | 0.95 | 0.032 | 3.31 | 0.047 | 4.86 | 0.053 | 5.69 | 88 | 22 |
| PP2 | | 2.27 | 0.078 | 3.37 | 0.114 | 4.92 | 0.124 | 5.56 | 88 | 22 |
| PP3 | | 5.29 | 0.097 | 1.80 | 0.211 | 3.91 | 0.208 | 4.00 | 88 | 22 |
| PP4 | | 0.04 | 0.003 | NA | 0.004 | NA | 0.000 | NA | 88 | 22 |
| PP5 | | 5.00 | 0.203 | 3.98 | 0.287 | 5.63 | 0.287 | 5.85 | 88 | 22 |



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# Conclusion

- The modified VITROS® Immunodiagnostic Products Anti-HCV* assay demonstrated significantly improved clinical specificity compared to the current VITROS HCV assay with no impact on clinical sensitivity or assay precision.

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