



## How to perform water-aided colonoscopy, with differences between water immersion and water exchange: a teaching video demonstration

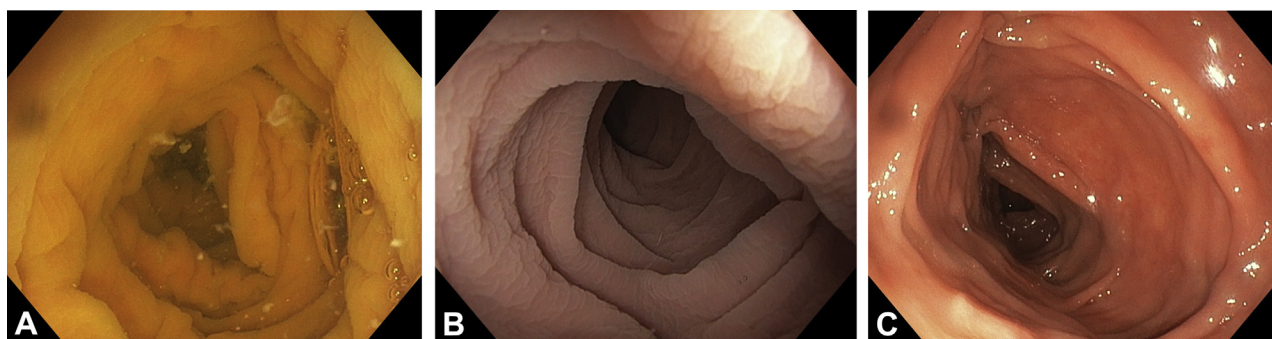
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Water-aided colonoscopy (WAC) encompasses different techniques entailing infusion of water as an adjunct to, or in lieu of, gas insufflation to distend the lumen during insertion (Figs. 1A-C). The colon is not elongated; bends and flexures are smoother and easier to negotiate.<sup>1</sup>

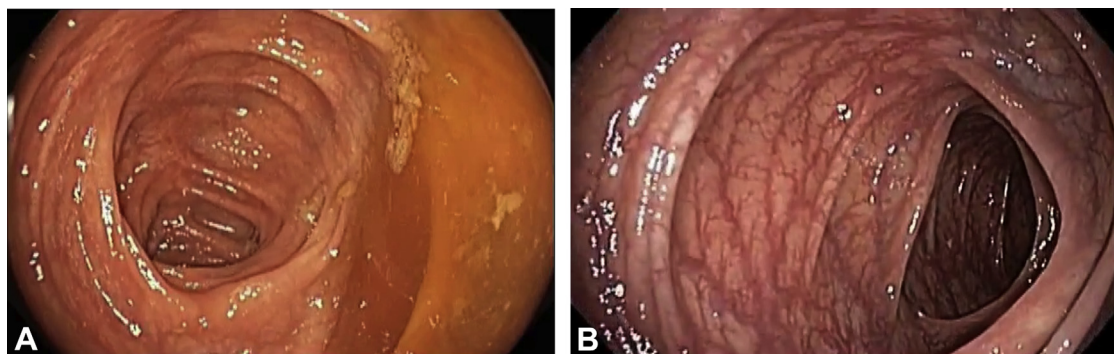
Infusion of warm-to-touch water is preferred because it decreases spasms of the musculature of the bowel.<sup>2</sup> However, warm water and room-temperature water are equally effective in decreasing the pain felt by patients during

instrument insertion.<sup>3,4</sup> There is no limit to the volume of water that can be infused to achieve cecal intubation.

Water immersion (WI) is an unstandardized technique in which water is infused to facilitate cecal intubation, with limited use of insufflation when necessary.<sup>1,5-7</sup> Opaque water is removed as needed to aid progression without maximizing cleanliness (Fig. 1A). Residual air pockets are used to bypass dirty content. Infused water is removed predominantly during withdrawal.



**Figure 1.** **A**, Water immersion. During insertion, colon preparation remnants can be used to aid instrument insertion. **B**, Water exchange. Insertion is done in clear water. **C**, Gas insufflation. View of the gas-distended lumen.



**Figure 2.** **A**, Water immersion. During withdrawal, some residual ponds of water must be aspirated to clean the lumen. **B**, Water exchange. During withdrawal, the lumen is perfectly clean.

Written transcript of the video audio is available online at [www.VideoGIE.org](http://www.VideoGIE.org).

Water exchange (WE), modified from WI, is a standardized technique that, through infusion and nearly simultaneous suction of water, entails substituting all colon content with a layer of clear water (Fig. 1B), allowing gasless instrument progression to the cecum, minimizing distention and maximizing cleanliness during insertion.<sup>1,8-11</sup> All residual air pockets are aspirated during this phase. The suction port is kept at the center of the lumen (the tip of the colonoscope slides alongside the colon wall at 11 o'clock).<sup>1</sup> When the lumen ahead is not evident, the instrument is slightly withdrawn to facilitate the exchange of water, and the infusion is started again.<sup>1</sup> Infused water is removed predominantly during insertion.

When WE is used, almost as much water is infused and aspirated during insertion to maximize cleanliness and to avoid colon distension. The correct implementation of WE can be objectively quantified by checking that, upon reaching the cecum, the discrepancy between the volumes of infused water (eg, level of water container) and aspirated water (eg, aspirator level) is small.<sup>8-11</sup> With both techniques, withdrawal is carried out with the use of insufflation (Figs. 2A and B).

Randomized controlled trials suggest that WAC, compared with gas insufflation, significantly increases the cecal intubation rate, reduces pain and requirement for sedation, carries high patient satisfaction and willingness to repeat the procedure, and increases adenoma detection in the proximal colon.<sup>1-9,11,12</sup>

Uniquely, WE is the least painful insertion technique, significantly increases colon cleanliness (even after split-dose preparation and in the right side of the colon), and significantly increases the adenoma detection rate (also in the right side of the colon).<sup>8-12</sup>

WI is easier to learn and may be indicated for patients undergoing unsedated or minimally sedated colonoscopy for symptoms who have fewer colon lesions, making a quick examination as comfortable as possible.<sup>1</sup>

Although WE requires a training period, it outperforms the other techniques for several outcomes and may have an important role in improving the quality of screening colonoscopy.<sup>1</sup> WE requires about 3 to 5 more minutes to achieve cecal intubation than does WI. The presence of solid stools prevents the use of WE.

In this video (Video 1, available online at [www.VideoGIE.org](http://www.VideoGIE.org)) we demonstrate how to perform WAC, highlighting the difference between the WI and WE techniques.

## DISCLOSURE

*All authors disclosed no financial relationships relevant to this publication.*

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*Abbreviations: WAC, water-aided colonoscopy; WE, water exchange; WI, water immersion.*

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