There has not been much activity in the handpiece lubrication and purging category for quite a while. The last new product that we have evaluated was in 2013, so it appears making quantum leaps in technology have been hard to come by. Indeed, the two new products in this preview are really not entirely new since they are second generation versions of items that we first evaluated in 2006.

Both products resemble their forebears, especially the QUATTROcare Plus, which except for the color is a dead ringer for the original version. The unit is still box-shaped, off-white plastic and gray metal (original was aqua), with four bubble-like modules extending out from the front and top. The door to the inside of the machine is hinged on the bottom of the front panel and is opened by merely pulling down from the...
bilateral recesses on its sides. The soft touch control panel is located on the far right side of the top of the unit. The rear of the unit has the power and compressed air connections as well as the on-off switch, which would be more convenient on the front.

The right side still has a chamber that houses the can of lubricant that is used to lubricate the handpieces, which is accessible through a rear-hinged door. The can is merely screwed onto the threads and that is it. There is no liquid oil to deal with and no possibility of a spill.

On the other hand, the improvements in the iCare compared to its predecessor (Care 3 Plus) are more significant. While its footprint is almost a square, the front surface slopes backward in a graceful curve, giving it a more contemporary look and feel. The access door to the handpiece connections, which is now an attractive dark translucent, matte textured plastic (original was colorless), dominates the front of the unit and is easily opened using the integrated, molded handle. Hinged on the bottom, the door opens downward. Inside the door, there are four separate and removable sponges called mist filters (this model accommodates four handpieces compared to three for the original model) that collect the purged oil to keep the chamber of the machine clean. Once these sponges get overly soiled, you discard them and install new ones. In addition, there is an oil absorber sheet, which is rectangular, made from some type of synthetic material, and sits in the bottom of the handpiece chamber to absorb residual oil after a lubrication cycle.

The top of the iCare, which is clad in off-white plastic, has a rear-hinged, flip-up door. When the door is opened, you have direct access to the oil reservoir hatch. This is a much cleaner look than the original model, which had the oil reservoir hatch visible on the top of the unit.

The hatch screws off easily and, after installing the oil filling nozzle on the bottle of oil, you can fill the unit quickly and easily. Although this oil filling nozzle is better than the old funnel, it can still be very messy if it overflows. There is an oil LED light on the control panel (see below) to tell you when you are getting low on lubricant.

The dimensions and weights of these units are as follows:

<table>
<thead>
<tr>
<th></th>
<th>QUATTROcare Plus</th>
<th>iCare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>14.6in/37.1cm</td>
<td>14.1in/35.8cm</td>
</tr>
<tr>
<td>Width</td>
<td>13.6in/34.5cm</td>
<td>10.5in/26.7cm</td>
</tr>
<tr>
<td>Depth¹</td>
<td>12.0in/30.5cm</td>
<td>12.0in/30.5cm</td>
</tr>
<tr>
<td>Depth²</td>
<td>20.0in/50.8cm</td>
<td>22.5in/57.2cm</td>
</tr>
<tr>
<td>Weight</td>
<td>22.0lb/10.0kg</td>
<td>14.3lb/6.5kg</td>
</tr>
</tbody>
</table>

¹ including cords with the door closed
² including cords with the door fully opened

If your countertop space is tight, the iCare unit would be a better bet since it is definitely smaller. The weight is highly unlikely to be an issue since either unit will be parked in a spot on your countertop and rarely, if ever moved.

From a control panel perspective, the QUATTROcare Plus is smaller and simpler since it only has the activation button, LEDs signifying the operational status, the chuck service button, and the LED that will glow when you need to replace the can of cleaner/lubricant. The control panel on the iCare, however, is more visible on the front of the machine directly above the door. The four handpiece controls are labelled in large numbers that are difficult to miss. As noted above, it will now accommodate four handpieces (original model only fit three) and operates in three purging modes.

The QUATTROcare Plus is simpler and faster to set up. After installing the can of lubricant, you are ready to roll.

The iCare, however, is not quite as easy. When you first get the unit or after draining and refilling the unit with oil, you are instructed to prime it with oil. If you don’t perform this task, the unit presumably will not perform optimally. To do this maneuver, you turn on the power and simultaneously push the Chuck Cleaning button, which is located on the far right side of the control panel. The unit will beep and an orange
light illuminates to the left of the Oil inscription on the control panel.

Then you open the door and push one of the so-called Joint Selection buttons until oil starts to drip out. These Joint Selection buttons, which is a strange name for each handpiece connection, are labeled 1-4 on the control panel and have LED lights immediately above each button. Then you turn off and on the unit again, followed by pressing each Joint Select buttons until all indicator lights are glowing. Finally, you press the Start button located on the top, right side of the control panel, the action of which activates each of the four handpiece connections. The unit sequentially primes each station, beeps, and then the handpiece connection light deactivates.

When we opened the door after this priming exercise, the inside was pretty much coated with oil, while the lights above each handpiece button glowed bright blue.

There is also a beep volume control. You start with the door closed and the power off. Push and keep constant pressure on the button designated as Air to the left of the Start button on the top row of the control panel. Then turn on the unit. The volume of the beep will change from low to high each time you do this task. Most likely, you will only do this once after you decide which sound level you prefer.

After the setup, you need to be sure the handpiece connections fit your handpieces. Inside the swing-down door for the QUATTROcare Plus are the coupler connections for four handpieces. Couplers are available for all of KaVo’s handpieces as well as those from most other manufacturers. According to the manual, our unit was supposed to come with one MULTIflex and three INTRAmatic couplers, but that is not exactly what we received.

In our unit, the far left coupler fit the COMFORTdrive electric handpiece, the second one fit E-type angles for electric handpieces, and the two on the right, presumably MULTIflex, did not fit any of our handpieces (including KaVo highspeeds), so we removed them by loosening the union nut. In their places we installed a Midwest slowspeed and a KaVo coupler for high-speed KaVo handpieces.

Note that the manual states the MULTIflex coupler must be installed on the fourth position (far right) when you need to lubricate the chuck (see below), so for this function, we reinstalled it in its correct spot.

When the door is opened, the couplers swing out to provide more access to connect the handpieces. Attached to the inside of the door is a reservoir tray for the overspray of lubricant. This tray is removable for cleaning, but our hunch is that most offices will choose to wipe it down in place.

For the iCare, toggle the power switch at the bottom of the middle right side of unit where the off-white plastic of the front of the sides and top of the unit join the dark gray plastic of the rear section. There is a beep followed by the illumination of the blue LED to the left of the Power inscription on the left side of the control panel. There is also a blue LED glowing next to the S setting to the right of the Air button.

Open the door to access the handpiece connections. The first connection has a circular, screw-on connector specifically for handpieces with a Midwest 4-hole backend. However, for our test run, we used a 2-hole Midwest Rhino slowspeed handpiece, which fit fine.

The other three connections are for E-type handpieces. If you want to attach any other handpiece, you need to buy an adaptor. The handpieces merely snap onto the connections. Quick and easy. Close the door and then select the air purge mode. To do this, you push the aforementioned Air button, which has three lights labeled S, M, and L to its right. These mean short, medium, and long. When you push the Air button, you cycle through the three levels with a beep each time.

With the QUATTROcare Plus, once the handpieces are attached, close the door and proceed to choosing the purging duration for each handpiece. To do this, you are supposed to push and hold the white start button found on the lower section of the control panel, but instead of the purging function (called blow-out in the manual), the machine began operating. As each handpiece was completed, the LEDs numbered 1-4 in the middle of the control panel illuminated one by one. We never did figure out how to change the purging time.
With the iCare, push Start. Each handpiece will be lubricated one at a time in sequence, with the machine automatically going from handpiece to handpiece. The blue LED above each handpiece will blink when it is being lubricated and purged. Unlike the previous model, lubrication and purging is done automatically; you do not need to begin a separate purge cycle as you had to do with the old version. After all handpieces are lubricated and purged, the unit will beep. To remove the Midwest handpiece, you just unscrew the connection. For the E-type, there is a small button on the front of the connector that you push and the handpiece is released.

For the full cycle of lubricating and purging four handpieces, the QUATTROcare Plus took 2 minutes and 55 seconds, while the iCare using the medium purging mode required three minutes and 37 seconds.

For the chuck cleaning/lubrication function, both machines revert to a manual mode. With the QUATTROcare Plus, you need to switch the machine to the chuck service mode by closing the front door and holding down the chuck service button on the control panel for a few seconds until the spray canister yellow LED flashes. Then install the gray plastic chuck service coupler, which you should have stored in a holding area inside the lubrication can door, on the MULTIflex coupler in the fourth handpiece position.

Insert the pointed end of the chuck coupler into the chuck opening in the front of your handpiece, cover with a paper towel, hold the handpiece firmly, and push the chuck service button. All four green LEDs illuminate, you hear a whooshing sound, you feel the excess lubricant hit the paper towel, and about two seconds later, it’s done.

With the iCare, you also need to install the chuck cleaning nozzle on the fourth connector by merely pushing it into place like if it were a handpiece. Then you push the chuck cleaning button, which is immediately to the right of the fourth handpiece button. This will illuminate the blue LED above this button, a beep will sound, and the other three connectors will be deactivated. Insert the pointed end of the nozzle into the chuck opening in the front of your handpiece, hold it firmly and push the Start button. You will hear a whooshing sound and 13 seconds later, it’s done.

Since this is only a preview, we can’t come to any definitive judgements on which unit would fit your needs better, but from this initial comparison, there are a few items that stand out.

As noted above and as clearly seen in the photo of the units side by side, iCare is the more compact and has a more contemporary design. While the QUATTROcare Plus is not ugly, its design, which has been around for at least 11 years, looks dated to us. In addition, the smaller dimensions of iCare means it takes up less countertop space.

The iCare unit also scores points with its disposable sponges and oil absorber sheet in keeping the unit reasonably gunk-free, while you need to improvise by using paper towels with the QUATTROcare Plus.

For the ease of setup, the QUATTROcare Plus is the clear winner. Just install the can of lubricant and that’s it. With iCare, you have to manually pour the oil into the reservoir and prime the machine.

Speed goes also to the QUATTROcare Plus, but iCare is not far behind.

Then you can’t forget about the price, which clearly favors iCare by almost $500.

iCare has been submitted for a full evaluation, so we’ll have a better idea of its appeal in several months. KavoKerr has not yet decided if it wants us to scrutinize QUATTROcare Plus more closely. And there is still the Statmatic 31 from SciCan. It is our current #1 in this category, so it will be interesting to see if iCare can knock it off its high perch. Stay tuned for that decision.
There are several facts of life that occur in many (most?) dental practices when it comes to applying bonding agents. The first fact, which plagues virtually all products, equipment, and materials, is ignoring the DFU/IFU, aka directions/instructions for use. You think you know how to use a product because it seems to be similar to others you have used in the past. So you may glance at the chairside technique card that comes with many products these days, but these cards are meant to supplement the main directions, not replace them. This is due to the technique cards omitting many of the details from the main instructions that can mean the difference between success and failure. However, those main directions, which are typically printed on thin, plain paper (they are easily contaminated and virtually impossible to disinfect) in a font that requires loupes to read, and are many times long-winded, cryptic, and incomplete. So it is no wonder you may ignore them and only follow the aforementioned technique card.

The second fact about applying bonding agents is the tendency to be impatient and not allow them to dwell on the walls of your prep for enough time to perfuse into the tooth structure. This application brevity can result in less than expected performance from the adhesive and can manifest itself in post-op sensitivity, restoration dislodgement, and later down the road, brown lines at the margins, signifying marginal leakage.

The third fact relates to isolation of the operative site. Since dental dams (remember: no rubber any more) are seemingly only used by a small percentage of clinicians for procedures other than endo, the risk of contamination is always present. So you want to move forthrightly through your procedure before the patient inundates the operative site with saliva.

And finally and certainly no less importantly, you have office overhead always bearing down on everything we do today in practice, which means you need to be time-efficient to earn enough to pay those bills and maybe even realize a slight profit for fun and entertainment.

With all this in mind, Kuraray, the manufacturer of the 5 Star, #1 rated, gold standards in self-etch adhesives and resin cements, namely Clearfil SE Bond 2 and Panavia V5 respectively, has just introduced still another bonding agent called Clearfil Universal Bond Quick. From its name, you can already see that the clever folks at Kuraray realized that even though they had created some terrific products, they still required several steps and more time than many dentists were willing to spend when applying a bonding agent.

Just like its namesake, it is a universal, single-component bonding agent that is stated to work with all
direct and indirect procedures as well as with all etching protocols and dentin hydration conditions, i.e., dry, moist or wet. And unless you are using it with other Kuraray products such as Panavia SA Cement Plus or Clearfil DC Core Plus, you still need to mix it with Clearfil DC Activator for dual-cured and self-cured composites and cements.

So how is it different than the conventional Clearfil Universal Bond? According to Kuraray, Quick has a new amide monomer that “rapidly permeates dentin and enamel” that presumably only requires three seconds of application with a rubbing motion. This new monomer combined with tried and true MDP is stated to “provide a very high curing property” resulting in “higher bonding strengths, less fluid absorption, and no waiting time.” It also releases fluoride, but we wonder whether its quantity has clinical efficacy.

Its composition includes HEMA, bisphenol A diglycidylmethacrylate (BIS-GMA), 10-methacryloyloxydecyl dihydrogen phosphate (MDP), hydrophilic amide monomers, colloidal silica, silane, sodium fluoride, and CQ in ethanol and water. Its pH is 2.3 and, when mixed with DC Activator, it is 3.5. Film thickness is stated to be 5-10 microns.

Our definitive bond strength tests could not be completed for this report, but according to Kuraray, Quick with only three seconds of application has slightly higher values than the original version after 10 seconds. Note that when we tested the original version, we found two sequential applications of 10 seconds produced higher bond strengths than one application. It remains to be seen if the performance of Quick can be enhanced in a similar manner. For this preview, we only received the Bottle Standard Kit, which comes in an easy to stack box with product identification on three sides and top. Plastic shrink-wrapped for security. Expiration date is on a label on one side. The standard squeeze-type bottle has moisture-resistant printing that includes the expiration date, but the light gray printing is difficult to read, although it resists removal during disinfection procedures. Note that the kit did not include DC Activator, which is an a la carte item.

The directions, as noted previously, come in the typical multi-language, plain paper, annoying foldout format plus six, color-coded, plastic-laminated treatment room cards with a hole punched in one corner so they can be used in a flip-card style by attaching them with the supplied plastic ring.

The paper instructions are long and tedious to wade through, but reasonably easy to follow. Beveling porcelain in the marginal area is still being recommended when performing a repair, but beveling can result in the repair material being overly thin and more likely to flake off or fracture under occlusal load. “Adherend surface” is also still used, but its meaning can be nebulous.

The laminated, treatment room cards feature color illustrations and easy-to-follow, step-by-step application procedures. Overall, the cards are well done, but still omit how to treat the tooth prior to applying the adhesive.

Everything else being equal, it is hard to argue with faster application and less technique-sensitivity along with better performance. Kuraray usually delivers on its claims, although future tests will determine whether two applications are more effective than one. We have just begun a complete evaluation of this product, so stay tuned for those results.