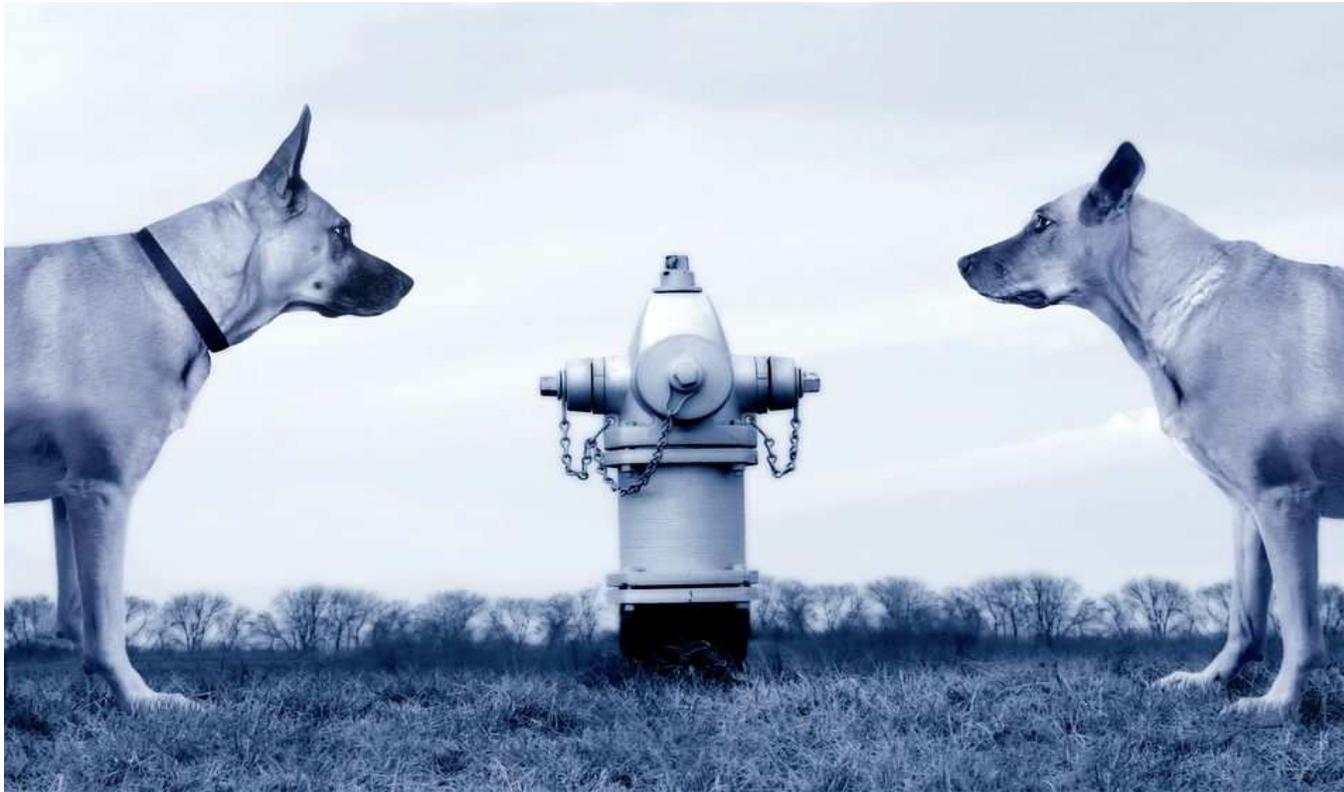


Airborne Urination Management for Pilots





Preamble

- Whether you have undertaken a lengthy cross country flight or a local cruise, if you're maintaining adequate hydration (see the module entitled "Physiologic Dehydration"), you will likely feel the urge to urinate.
- As this urge becomes more intense, you can become more and more uncomfortable and distracted.
- This is not a safe situation as your focus must be on flying and not "holding out" until you land.
- So the safe thing to do is to urinate!
- There are five (5) options to urinate:
 - 1) Wet yourself and the glider cushions, etc;
 - 2) Urinate into absorbent underwear;
 - 3) Use a specialty urine collection bag or a Zip-Lock bag;
 - 4) Urinate into a condom catheter or external bulb connected to a rigid overboard tube; or
 - 5) Urinate into a condom catheter or external bulb connected to a urine collection bag.
- Option one (1) is undesirably uncomfortable and results in a cockpit odour that is difficult to remove.

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- Option two (2) is acceptable and is an option for females. The total absorptive capacity of such underwear is limited and urine production can exceed this. Extra absorptive pads might be needed. An adhesive cup used by female scuba divers and others is an option too (see <https://www.stadiumpal.com/product/stadium-gal-kit/>).
 - Option three (3) is favoured by some pilots. The risk is a significant spill occurring while you're trying to fly and urinate.
 - Option four (4) is a good one but you must be able to install a condom catheter or risk a bulb spill;
 - However, when using option four (4), it is recommended that a flexible tube perhaps a half metre or so in length be connected to the outside end of the rigid tube. This avoids spraying corrosive (acidic) urine over the aircraft's empennage and hardware connections. Also, not all club aircraft will be fitted with an overboard urination tube.
 - An important deficiency of option four (4) is that you cannot monitor the colour/volume of your urine as an indicator of your state of hydration unless the tubing is clear (see the module entitled "Physiologic Dehydration"). Even then, it's not easy to monitor flowing urine.
 - So many pilots favour option five (5) as it not only avoids the deficiencies of option three (3), it allows the connection of an empty collection bag if one becomes full, thus eliminating concern about drinking sufficiently and urinating excessively.



Components of a Urine Collection System

Here's what is needed to set up your urine collection system in club or privately owned aircraft.

- Modified underwear;
- Condom catheter sizing tool;
- Condom catheter;
- Condom catheter retention strap;
- Flexible tubing from the catheter to a urine collection bag;
- 1.0 litre urine collection bag; and
- An extra urine collection bag.

The components are available from most medical supply vendors (e.g. Shopper's Home Health, <https://www.cathetersplus.com/> , <https://www.canmeddirect.ca/>).

Often a box of many catheters/bags is the minimum that must be purchased if you want to do this on-line so sharing the purchase with other pilots makes good sense.

Underwear

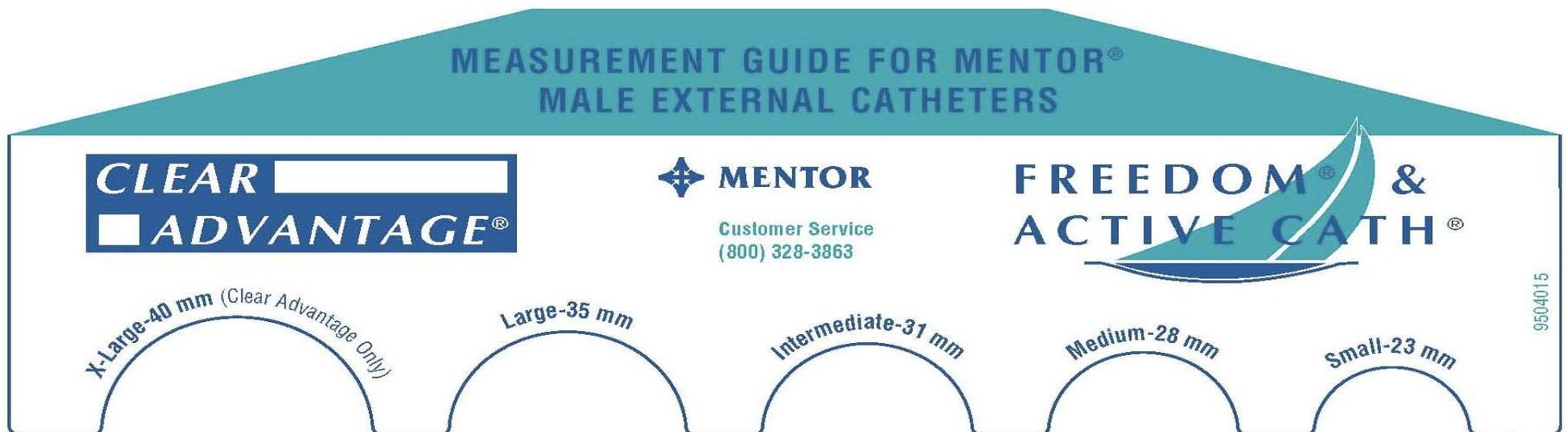
- Men's underwear often has a double front portion that requires reaching through the slot to grasp the penis.
- This double front is not ideal for use with a condom catheter as it can collapse the outer portion of the catheter tubular end. Thus, when urination is initiated, if urine cannot flow freely into the bag, it backs up between the catheter and skin, thereby releasing the catheter. However, many pilots wear this type of underwear.
- Given this possibility, a option is underwear without the front double portion which can be modified by cutting a slit to accommodate the catheter tubular end, thus preventing end collapse.



Cut slit with scissors as shown. Hand wash to avoid the cut edge of the fabric fraying.

Condom Catheter Sizing Tool

- All manufacturers of condom catheters provide a sizing tool. This tool measures the diameter of the mid shaft of a flaccid penis to facilitate selecting a catheter size. Some experimentation might be needed to choose the size that is best for you. Here's an example. Buy the "long" length size.



The Condom Catheter



- Condom catheters are quite unlike those used in sexual intercourse.
- These are manufactured from opaque latex or a silicone polymer. Silicone catheters, while being a bit more expensive, are best as these “breathe” well and are clear so that urine colour and any urine backup can be monitored.
- Many condom catheters have the interior surface coated with an adhesive to help them remain in place yet be easily removable.
- The outer end of the catheter has a “bell” to accommodate the foreskin of an uncircumcised penis and a short tube which connects to the urine collection bag tube.
- Some silicone polymer models have a series of ringed ridges around the tube to prevent collapse.

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- Instructions concerning condom catheter installation are provided by the manufacturer and can be viewed on YouTube.
 - Basically, the catheter is removed from its packing cone by grasping and pulling the tube portion.
 - Grasp the penis just at its head, place the catheter onto the head, and roll it back on the shaft. This sounds easy but it does take some practice as its more difficult than installing a conventional catheter on an erect penis.
 - Squeeze the shaft of the penis to ensure good adhesion of the catheter to your skin.
 - Always have a few extra catheters on hand in case you bungle the installation.
 - Remove the catheter by pinching its edge on the penis shaft and rolling it outward.
 - Care should be taken that the catheter adhesive does not attach to pubic hair. Shaving might be needed.

Condom Catheter Retention Strap

- Once the condom catheter is installed, the next step is to install a retention strap. This is a soft elastic/Velcro strap that encircles the penis to prevent the catheter from sliding off.
- Condom catheters can slide off, often due to excessive perspiration between the catheter and skin, or the backup of urine between the catheter and skin.



Posey Medical Supplies makes a really nice one termed the Posey Sheath Holder! (Available from CanMed Direct)

The Urine Collection Bag

- The urine collection bag is supplied with tubing to connect to the condom catheter and elastic straps to secure the bag to your lower leg. Many pilots discard the straps so that the bag can be placed on the floor and examined periodically for urine volume and colour.
- The bag should be free of entrapped air. If not, open the drain valve, flatten the bag to expel any air and close the valve.
- The bag drain can be either a rotary valve or a stopcock. The rotary value models are best as, unlike the stopcock valve, it cannot be opened accidentally by snagging it on something.
- The bag contains an internal one-way valve to prevent backflow. So there's no worry of leaking when the bag is changed to another nor disconnected at the end of a flight.
- The bag can be washed out and re-used.

Rotary valve



Using the System

- It's recommended that you set up your system and test it while on the ground. Everything must work properly as you won't be able to change it when airborne. Here's the steps:
 - 1) Install the catheter and retention strap.
 - 2) Put on the modified underwear under fairly loose outerwear.
 - 3) Attach the tubing to the urine collection bag. On the ground, determine the minimum length needed, when you're seated in the aircraft, for the bag to rest on the floor. Cut the tubing to size if needed. The longer the tube the greater pressure needed to expel urine into the tubing.
 - 4) Become seated in the aircraft, open your outerwear zipper or undo the waist, and attach the free end of the tubing to the catheter. Do not insert the tubing hard end very far into the catheter. If you have to bail out, the connection must easily fail! Arrange the catheter/penis so that it points somewhat upward. Put the bag on the floor.
 - 5) Test that you can void urine a bit "uphill" into the catheter and that it drains into the bag.
 - 6) Because the tubing contains air that cannot be expelled, urine tend to drain along one side of the tube.

- When the bag fills to about 800ml, change to the second bag at the bag connection. Before doing so squeeze any residual urine out of the catheter and tubing.
- After your flight, disconnect the tubing at the catheter, drain the urine and store the tube and bag in a Ziplock bag for later cleaning and re-use.
- Remove the catheter at your convenience.
- Sometimes the catheter really adheres tightly to skin. Do not pull it off rapidly as skin will come with it. Remove it gently. You might need to surround it with a warm cloth to soften the adhesive.



This system of urine management, if done correctly, will avoid the embarrassment and headache of an airborne accident!