# PipetteRite© User's Guide

# Part 1. Safety

## 1.1. Neodymium Magnets Safety and Handling Tips

Round neodymium magnets stuck to the pipette body provides a simple and easy way to couple the pipette with PipetteRite.

Please review this checklist to help you handle these magnets properly and avoid potentially serious personal injuries, as well as damage to the magnets themselves.

Neodymium magnets are the strongest, most powerful magnets on earth and the surprisingly strong force may catch you off guard at first.

**Keep the pipettes with neodymium magnets at least 1 foot from each other.**

If there are multiple pipettes with neodymium magnets, a safe distance of at least 1 foot between each other should be kept to prevent the magnets from slamming together.

**Neodymium magnets can jump together, pinch the skin and cause serious injuries.**

Unsecured Neodymium magnets will leap and slam together from several inches to several feet apart.

**Neodymium magnets are brittle – and can easily shatter and break.**

Neodymium magnets are brittle and will peel, chip, crack or shatter if allowed to slam together, even from just a few inches apart. Despite being made of metal and coated with a shiny nickel-plating, they are not as hard as steel.

Shattering magnets can send small sharp metal pieces into the air at great speeds. Eye protection is recommended.

**Keep neodymium magnets away from all children.**

Neodymium magnets are not toys. Do not allow children to handle or play with them. Small magnets can pose a serious choking hazard. If multiple magnets are swallowed, they can attach to each other through intestinal walls causing serious injuries and even death.

**Keep neodymium magnets away from anyone with a pacemaker.**

Neodymium magnets create strong magnetic fields around them, which can interfere with pacemakers, ICDs and other implanted medical devices. This is because many of these devices are made with a feature that deactivates the device in a magnetic field.

**Keep neodymium magnets away from magnetic media.**

The strong magnetic fields emanating from neodymium magnets can damage magnetic media such as floppy disks, credit cards, magnetic ID cards, cassette tapes, video tapes or other such devices. They can also damage older televisions, VCRs, computer monitors and CRT displays.

**Keep neodymium magnets away from your GPS and smartphone.**

Magnetic fields interfere with compasses or magnetometers used in navigation for air and sea transport, as well as the internal compasses of smartphone and GPS devices.

**Avoid contact with neodymium magnets if you have a nickel allergy.**

Studies show a small percentage of people suffer from an allergy to some metals including nickel. The allergic reaction is often manifested in redness and a skin rash. If you have a nickel allergy, try wearing gloves or avoid directly handling nickel-plated neodymium magnets.

**Neodymium magnets can become demagnetized at high temperatures.**

While magnets have been proven to retain their effectiveness up to 80°C or 175°F, this temperature may vary depending on the grade, shape and application of the particular magnet.

**Neodymium magnet dust and powder are flammable.**

Avoid drilling or machining neodymium magnets. When ground into a dust or powder, this material is highly flammable.

**Neodymium magnets can corrode.**

Our magnets are finished with nickel plating, and this coating provides enough protection for most applications. But remember, neodymium magnets are not waterproof. They will rust or corrode in the presence of moisture. If used underwater, outdoors or in a moist environment, they can corrode and lose magnetic strength.

### Recommendations on Handling Neodymium Magnets Safely

- Wear eye protection and work gloves (if necessary) when working with magnets.
- Pay close attention when you are separating or handling magnets.
- To separate magnets, grasp the outside magnet, slide it off the stack and pull it away quickly.
- When you have magnets in both hands, remember to keep your hands far apart.
- Do not drill or machine neodymium magnets.

## 1.2. Caution on Sliding Arm of PipetteRite

The sliding arm of PipetteRite can slide vertically (up or down), or horizontally (left-right). Avoid jolting the sliding arm at any time. Before moving PipetteRite around, secure the sliding arm with rubber bands, or tilt the device so the sliding arm stays at one end of the sliding rail and move the device slowly.

# Part 2. Introduction

## 2.1. Why PipetteRite is needed?

As always, easy said than done. While proper and consistent pipetting presents challenges, doing so with a multichannel pipette can be something to be desired for many, since we, not robots, do things somewhat different each time even with our best effort to be consistent, not mentioning person-to-person difference. Many, who can do pipetting jobs very well or sufficiently well, may still wish the job be easier and less stressful or less attention-demanding (just thinking about aliquoting the supernatant after precipitating the proteins while the solution volume is small and you of course don't want the pipette tips to touch the proteins at the bottom).

PipetteRite provides a solution for proper manual pipetting, simple and effective. By working hand in hand with your hand and limiting the pipette immersion depth and restricting unwanted movements and rotations of the pipette, it helps achieve proper and consistent manual pipetting in a less attention-demanding way.

## 2.2. How does PipetteRite work?

A pipette is mounted temporarily whenever needed to a sliding arm of PipetteRite, which, as predetermined, limits the movements and rotations of the mounted pipette relative to the microplates through a translation stage. More specifically, with PipetteRite, all the pipette tips on the mounted pipette are always at the same height; all the tips are always aligned with the corresponding columns or rows of the plates; and yet the tips are allowed to move above (but only above) a predetermined height and from column to column (or row to row). Two small magnet discs stuck to one side of the pipette facilitate simple and quick attachment of the pipette to and detachment from PipetteRite.

With the help of PipetteRite for multichannel pipetting, you only need control a single pipette tip, all the other tips will be positioned accordingly and correctly; and most importantly, pipette tips are prevented from traveling down below the predetermined limit and the immersion depth for all tips is controlled consistently. Consequently, with PipetteRite, manual multichannel pipetting

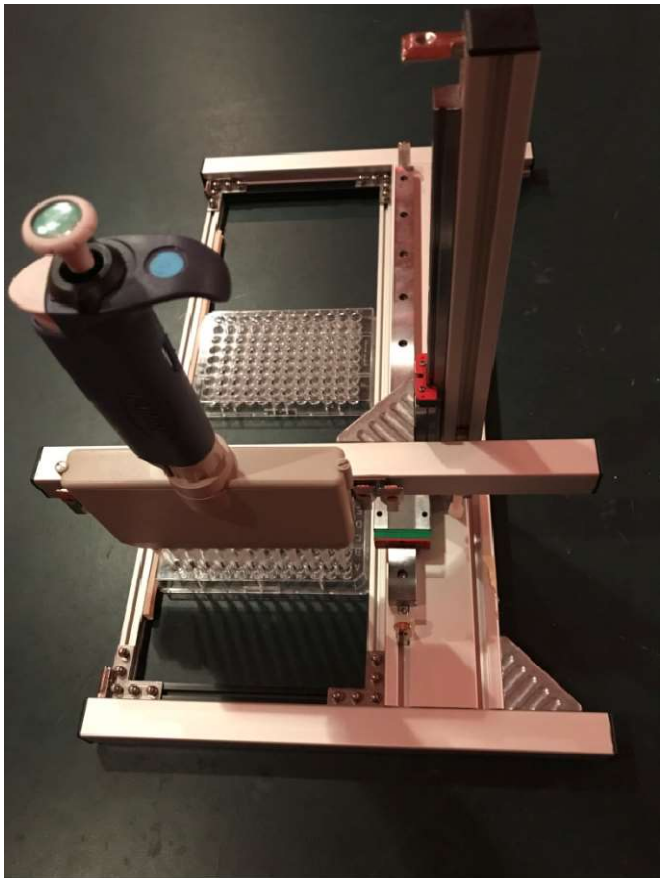
becomes less attention-demanding and more accurate and consistent. PipetteRite helps you pipette in the right and easy way.

To learn more, please watch PipetteRite in action (web link)

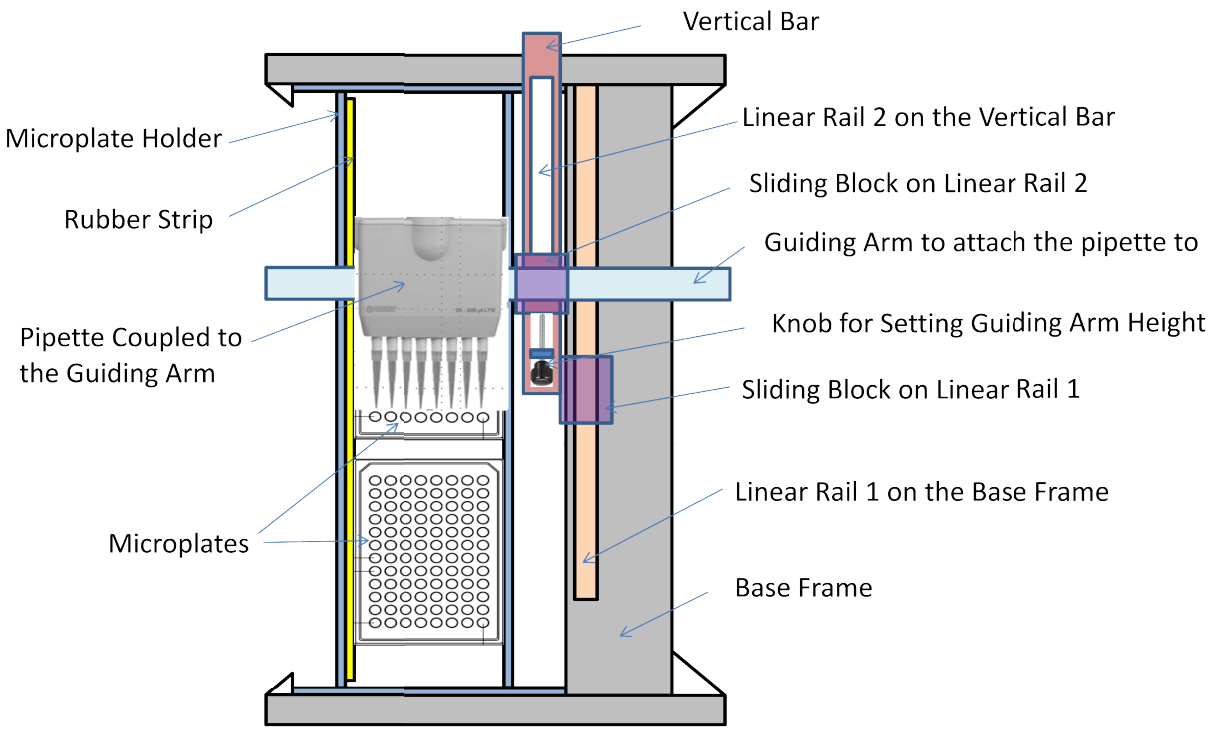
# Part 3. Setup of PipetteRite

## 3.1. Picture and Schematic Diagram of PipetteRite

### 3.1.1. PipetteRite picture



### 3.1.2. Schematic diagram




## 3.2. Items included in the PipetteRite package

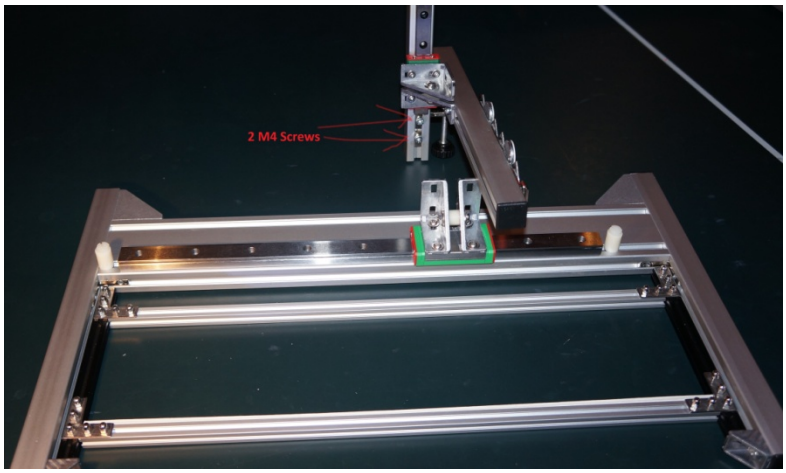
1. PF01, Main assembly, including the base frame and the guiding arm
2. PF02, Plate holder (for pipetting by column)
3. PF03, 6 strong magnet discs and 6 double-sided adhesive circles (enough for 3 pipettes)
4. PF04, A Hex-L Key Allen Wrench (for initial attachment of the guiding arm, and the adjustment of the lower limit of the guiding arm height in special situations)
5. PF05, Rectangular wood spacer (for vertical bar installation)
6. PF06, 2 M4 x 8mm screws (for vertical bar installation)

Extra parts available for order:

7. PF50, Plate holder for pipetting by row
8. PF51, Set of magnet for coupling pipette to the guiding arm (2 pieces)
9. PF52, Set of double-sided adhesive circles (2 pieces)

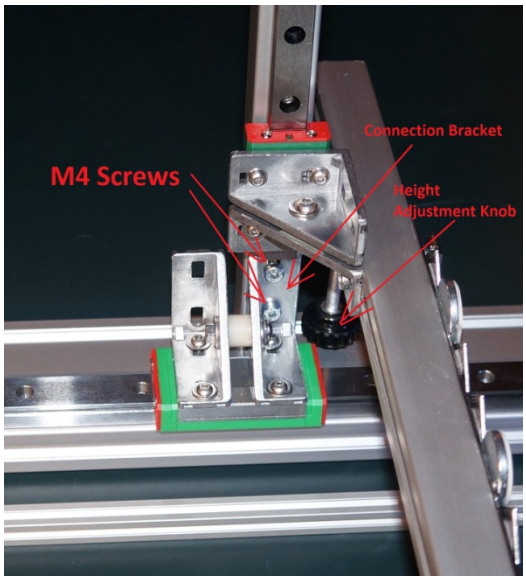
## 3.3. Attach the guiding arm assembly to the base frame

Place the base frame on a flat surface, and bring the guiding arm assembly to near the base frame, as shown in the photo below;

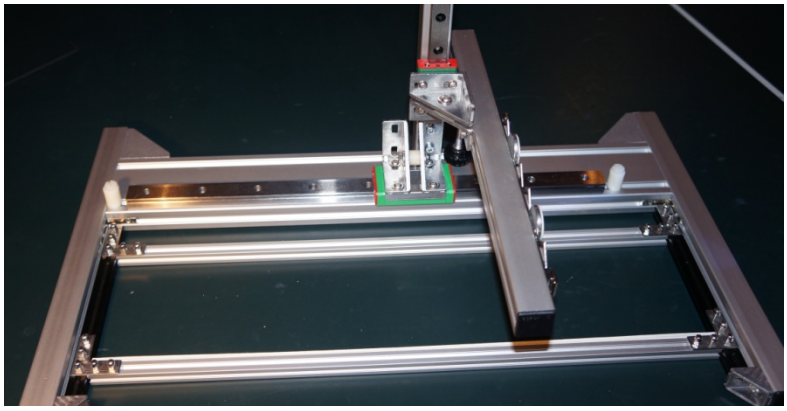



Unscrew and remove the 2 M4 screws (you may need use the included wrench);

As shown in the photo below, insert the two M4 bolts into the holes on the connection bracket, align the vertical bar with the connection bracket, lower the vertical bar until the gliding rail contacts the connection bracket (you may need adjust the guiding arm height through the height adjustment knob), and tighten the two screws (Do NOT over tighten the screws);



The photo below shows the guiding arm assembly attached to the base frame through the sliding block 1.



## 3.4. Placement of the plate holder and the microplates

Lift the base frame a little to allow the plate holder to be inserted from underneath. Please make sure the bar with rubber strip is on the side close to the user. A plate holder for pipetting by column is included in the standard package. The plate holder for pipetting by row is available as an option.

When place a microplate into the place holder, lower the plate side against the rubber strip first, and then lower the other side, as show below.

## 3.5. Stick magnet discs to the pipette body

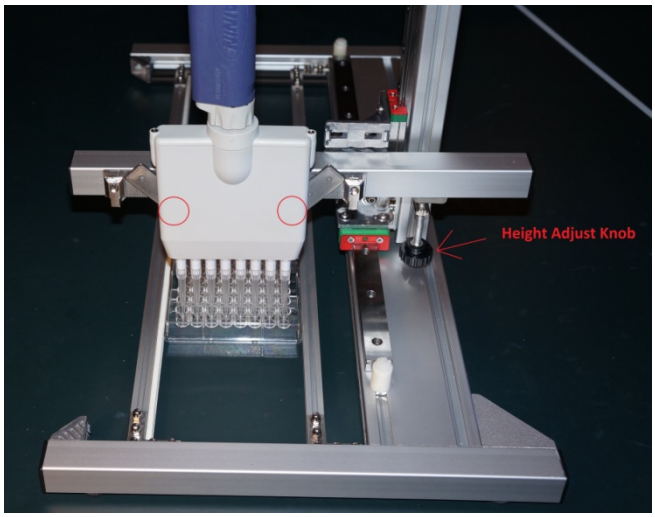
This is a simple but critical procedure to ensure proper alignment of the pipette tips with the wells of the microplates. Please proceed extremely carefully. This procedure must be performed with the base frame sitting on a near perfectly flat surface.

DO NOT REMOVE THT PLASTIC COVER OVER THE MAGNET DISCS UNTIL YOU ARE SURE WHERE ON THE PIPETTE BODY TO STICK THE MAGNET DISCS (PLEASE SEE BELOW FOR DETAILS).

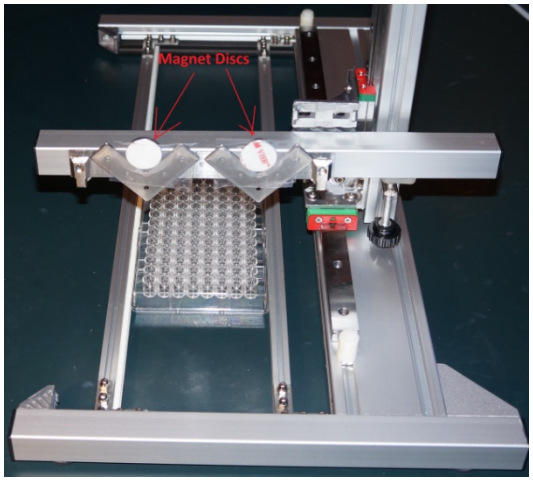
**Step 1.** Place a microplate to be typically used within the plate holder and make sure the plate fit the holder square and well.

**Step 2.** Mount pipette tips to be typically used to the pipette.

**Step 3.** As shown in the photo below, adjust the height adjustment knob until the pipette tips touch the bottom of the wells and the center of the pipette body is at roughly the same height as the guiding arm. The red circles show the approximate locations on the other side of the pipette body where the magnet discs to be stuck.

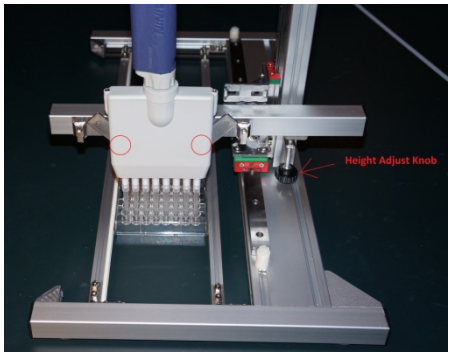


**Step 5.** The product comes with two magnet discs as shown in the photo below. Remove the protective films (two layers, one layer over the V receptacles and one layer just over the discs) over the magnet receptacles (see below). (To stick additional magnet discs to additional pipettes, essentially the same procedures should be followed).

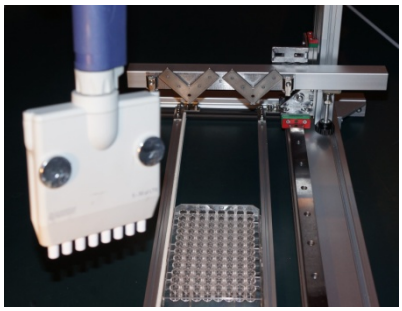



Make sure that the two magnet discs sit at the bottom of the V brackets.

**Step 6.** In this step for sticking the magnet discs to the pipette body, it's critical to keep the pipette tips well aligned with the microplate wells. Make sure the pipette tips are centered in the wells, do not apply force to push down the pipette, keep all the pipette tips touch the well bottom and keep your hands loose and relaxed, kind of try to let the pipette stand in the wells by itself, slowly slide the guiding arm towards the pipette, and press the pipette against the guiding arm, press the discs against the pipette, and hold the pressure for a minute.




**Step 7**. Finally, tilt the pipette to the right side a little and detach the pipette from the guiding arm. The photo below shows a magnet discs properly stuck to the pipette.

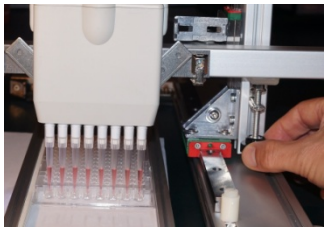


# Part 4. How to use PipetteRite

### 4.1. Set the lower height limit of the guiding arm

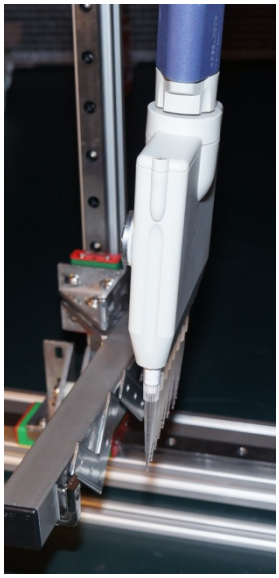
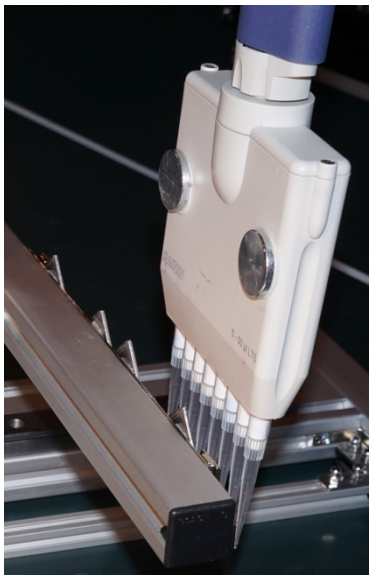
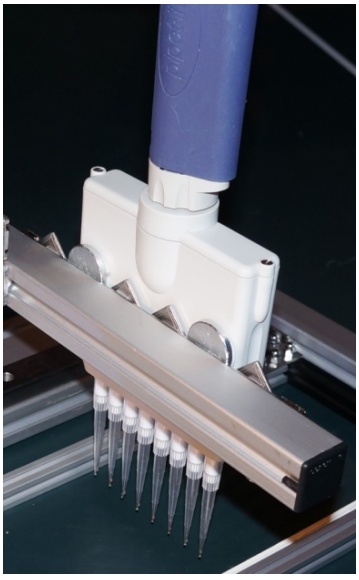
With the pipette coupled with the guiding arm and a plate in the plate holder, the lower height limit of the guiding arm can be adjusted as desired by turning the black knob while monitoring the pipette tip position. For better visual observation of the tips, one may position the tips outside but next to the plate, instead of inserting the tips into the wells. You may want to make a note for the guiding arm height reading for future reference and so you know the guiding arm height to set for your procedure.

If the desired guiding arm height cannot be reached (most likely you will never need to do this), you will need use the supplied Hex-L Key Allen Wrench to lose the set screw and tighten it at a suitable height. Please note that all your previously recorded guiding arm height setting readings have to be shifted by certain value to be useful after this adjustment.



### 4.2. Couple and decouple the pipette to the guiding arm

As shown by the photos below, to couple the pipette to the guiding arm, simply bring the pipette from upper right direction, align the magnet discs with the V receptacles on the guiding arm, and lower the pipette into the receptacles. Keep your hand loose, and the magnetic force will guide the pipette into position once the pipette near the receptacles. Do not slam the pipette to the guiding arm to avoid damaging the magnet discs.

To decouple the pipette from the guiding arm, tilt the pipette to the right first, and then pull the pipette away.

During the coupling or decoupling process, you may use your hand not holding the pipette to hold or lift up the guiding arm.

### 4.3. Examples of how to pipette with PipetteRite

#### 4.2.1. Pipetting with the pipette coupled with the guiding arm during both aspiration and dispensing step

When both the source and destination plates are placed into the plate holder, the pipette may remain coupled with the guiding arm during both aspiration and dispensing steps. You may use your left hand to lift the guiding arm along with the pipette in the process. The pipette tips will stay aligned and you only need move those to the intended column or row of the plates. Importantly, the same pipette tip immersion depth is maintained for all pipette tips as predetermined. Therefore, you do pipette in a right and easy way.

#### 4.2.2. Pipetting with the pipette coupled where needed

Whenever you need defined and consistent pipette tip immersion depth control, or easier targeting and aligning with the intended plate wells, you may couple the pipette onto the guiding arm and let it help guide you to those wells and obtain the desired immersion depth of the pipette tips.

# Part 5. Care and Maintenance

### 5.1. Remove the magnets

We recommend using dental floss (but do not use unwaxed floss), to work it in between the disc and the pipette and then back and forth, and cut through the glue under the disk. Again, those magnet disks are very strong; so please read the safety precautions in the User's Guide, and proceed with caution. Please refer to Section 1.1 for magnet safety tips.

### 5.2. Realignment

If the pipette tips are not centered when lowered into the wells of the plate in the plate holder, you may need remove the magnet discs and re-stick the discs to the pipette as described in Section 3.5. If all pipettes have the same off center issue, please contact PrepFree for detailed instructions for the realignment of the guiding arm.

### 5.3. Secure the sliding arm before moving PipetteRite

When move PipetteRite around, use one hand to hold the base frame and another hand to hold the guiding arm to prevent the guiding arm from slamming to one end.

### 5.4. Dos and don’ts

Dos:

- Make sure the surface to place PipetteRite is flat
- Couple the pipette to the guiding arm when the guiding arm is not directly over a plate or it is raised so that the pipette tips will not bump the plate or tough the liquid in the wells during the coupling.

Don’ts

- Don’t slam the pipette to the guiding arm
- Don’t jolt the guiding arm
- Don’t let the guiding arm have a vertical free fall
- Don’t apply excessive force to the guiding arm
- Don’t place any two pipettes with magnet disc too close (keep them > 1 foot apart)

For more information, please visit www.PrepFreeLLC.com