

Blood Spot Collection Protocol

A note on safety. Make sure to follow Universal Precautions when collecting blood spot samples. Gloves should be worn at all times in order to prevent contact with blood. Hands should be washed immediately after gloves are removed. All sharp items, such as lancets, should be disposed of immediately after use in an appropriate (i.e., puncture resistant) biohazard container.

Supplies needed (see **Fig. 1**):

- Gloves
- Alcohol pad
- Filter paper – Whatman (formerly Schleicher & Schuell) 903 card or equivalent
- Lancet
- Cotton or tissue (Kimwipe or equivalent)
- Plastic Ziploc-type bag
- Desiccant
- Bandaid

1. Have subjects wash their hands under warm water. This will help to stimulate blood flow.
2. Choose a finger for the finger prick (**Fig. 2**).
 - it is generally best to avoid the thumb and pinkie finger
 - avoid fingers with thick calluses
 - avoid fingers with tight rings as they may constrict blood flow
3. Wipe the finger tip completely with the alcohol pad (**Fig. 2**).
 - do not blow on the finger to dry the alcohol
 - do not wipe off the alcohol
 - do not perform the finger prick until alcohol is completely dry
4. Ask subject to shake their hand to promote blood flow. It may also be useful to have them walk around for a minute or two to stimulate blood flow.
5. Gently knead their hand from palm to finger tip.
6. Hold finger firmly just below the center of the fingertip.
7. Press lancet flat and firmly against the finger (**Fig. 3**).
 - choose a lancet (e.g., low flow, medium flow, or high flow) appropriate for your subject
 - the best location is just to the side of the center of finger
 - if you are using a blade-type lancet, make sure it is positioned perpendicular to the fingerprint grooves
8. Trigger lancet.
9. Discard lancet in biohazard container.
10. Release pressure and allow a full drop of blood to collect on finger.
11. Once a drop of blood has collected on the finger, use the cotton or tissue to wipe away the first drop of blood (**Fig. 4**).

12. Collect remaining drops of blood onto the filter paper card. Attempt to obtain 5 good spots.
 - allow each drop of blood to fully form before dropping onto the filter paper (**Figs. 5-7**)
 - do not “milk” the finger to increase blood flow—instead, gently knead the hand from palm down in order to stimulate blood flow
 - wipe away blood that begins to clot or spreads unevenly with cotton

Do NOT:

- drop spot before full drop has formed – this creates small spots that should be avoided (**Fig. 8**)
- drop spots close enough that they overlap (**Fig. 9**)
- blot finger onto filter paper. Instead, you should let the blood drop naturally or touch the blood drop (not the finger) to the filter paper card (**Fig. 9**)
- add more than one drop of blood per circle (**Fig. 10**)

13. Hold cotton or tissue on the fingertip until bleeding stops and offer a bandage.
14. After fully spotting the filter paper card, allow it to dry before placing it into a sealed plastic bag. The card should be dried away from the direct sun and insects. Ideally, the filter paper card will be dried for at least 4 hours at room temperature (but no more than 24 hours).
15. Once the filter paper card is dry, transport the card in sealed plastic bag with a desiccant pack.
16. If card was not fully dried before it was transported, it should be removed from bag and allowed to fully dry.
17. After drying, replace the card in a sealed plastic bag with at least one desiccant pack.
18. The card should be immediately placed in a freezer for storage. If the card is being shipped to a laboratory, it should be shipped immediately or stored at 4°C until shipping.

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Additional information:

Additional information on blood spot collection and biomarker analysis can be found in:
McDade TW, Williams SR, Snodgrass JJ. 2007. What a drop can do: Dried blood spots as a minimally-invasive method for integrating biomarkers in population-based research. *Demography* 44: 899-925. ([link](#))



Figure 1. Supplies needed for blood spot collection



Figure 2. Choose finger and swab with alcohol



Figure 3. Place the lancet firmly on the finger and trigger



Figure 4. Discard first drop of blood

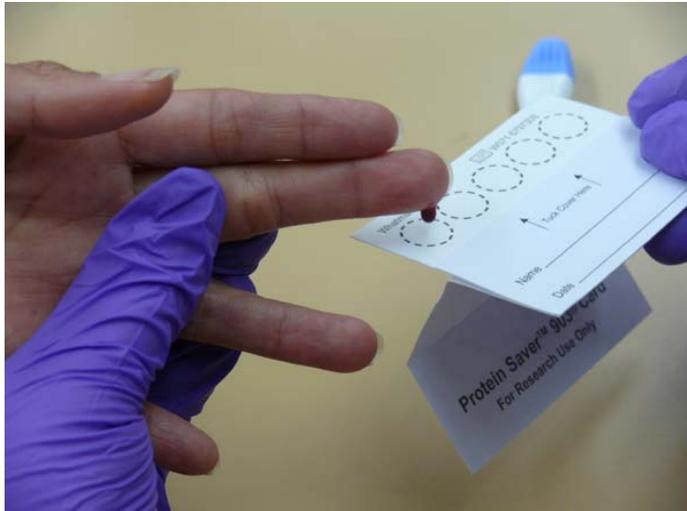


Figure 5. Allow blood to pool and drop onto filter paper



Figure 6. Fill all circles with blood

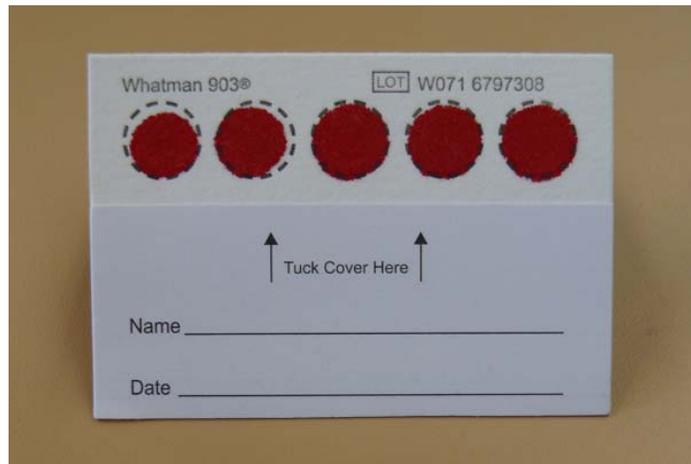


Figure 7. A completed card

EXAMPLES OF INCORRECTLY COLLECTED DRIED BLOOD SPOT SPECIMENS

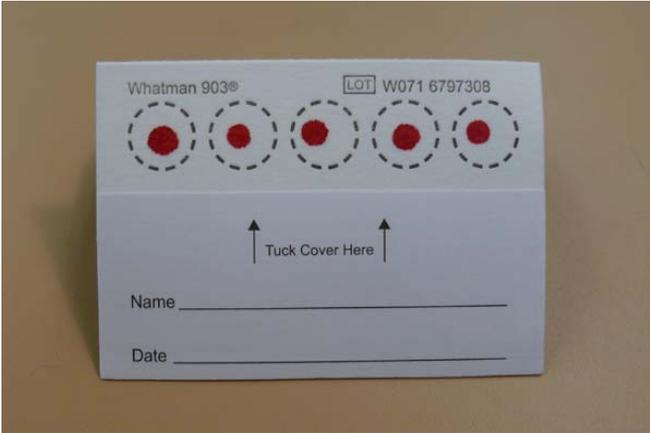


Figure 8. Try to avoid small blood spots if at all possible

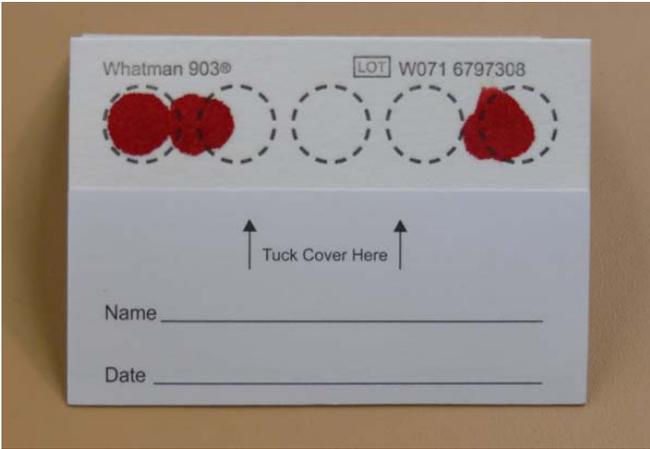


Figure 9. Do not position blood spots so close together that they touch (left) or blot the spots by making contact between the finger and the filter paper card (right; note the irregular border of this blood spot) (THIS CARD IS UNUSABLE)

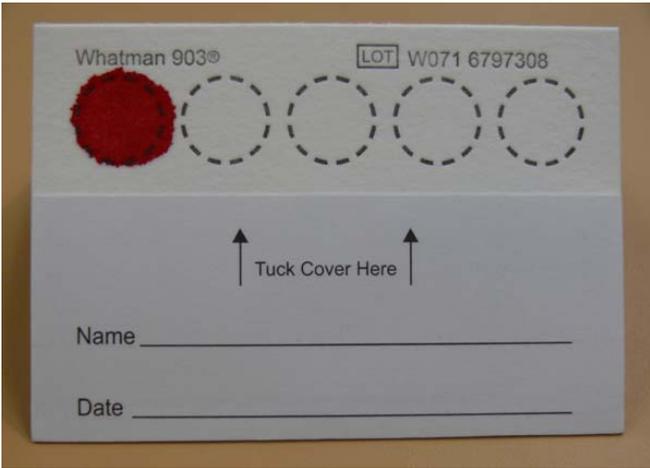


Figure 10. Do not double spot—this spot is made up of two drops of blood (THIS CARD IS UNUSABLE)