

# Risks and benefits of phlebotomy in the general population

## Introduction

Therapeutic phlebotomy is the name for taking blood in order to treat an illness or reduce the risk of a complication. It is most commonly used in conditions such as polycythaemia (where the body has too many blood cells which thicken the blood and risk complications, haemochromatosis (where the body has too much iron on board and it becomes toxic) and genetic conditions like sickle cell disease (where blood cells don't form properly) or porphyria (where certain toxins accumulate because a person doesn't have the mechanisms to break them down like most people do) (Assi and Baz 2014).

## Risks from phlebotomy

Phlebotomy is an extremely safe procedure and the risks outlined below are either extremely rare, minor and self-limiting or both. The main potential risks from phlebotomy are (Newman 2004):

### 1) Physical Risks:

- a) Discomfort and pain: During blood donation, individuals may experience temporary discomfort and pain at the site of needle insertion. Although this is typically mild and transient, some donors may find it uncomfortable.
- b) Dizziness and lightheadedness: A common risk during or after blood donation is the onset of dizziness or lightheadedness. This can be attributed to a drop in blood pressure, which may occur due to the removal of a significant volume of blood.
- c) Haematoma and bruising: Occasionally, donors may develop a haematoma or bruise at the needle insertion site due to accidental damage to blood vessels during the procedure. While these complications are generally minor, they may cause discomfort and require symptomatic treatment.
- d) Arterial or nerve puncture: Damage to other structures in the area of the body from which blood is taken (the front of the elbow area, known as the antecubital fossa) is extremely rare, but it could result in severe bruising or even interruption of the blood flow to the lower arm if an artery is damaged, or nerve damage interfering with movement or feeling in the lower arm.

### 2) Infection risks:

- a) Needlestick injuries: Healthcare professionals who collect blood donations take precautions to ensure safe needle usage. However, there is always a small risk of needlestick injuries during the process, potentially exposing the donor to bloodborne infections such as HIV, hepatitis B, and hepatitis C. The likelihood of this happening is very low (Prüss-Ustün, Rapiti and Hutin 2005).
- b) Bacterial contamination: Although stringent hygiene protocols are in place and sterile, single use needles are used for blood donation, bacterial contamination of the needle could theoretically occur, leading to a potential risk of infection. The likelihood of this happening is very low.

- 3) Iron deficiency: Frequent blood donation can deplete the iron stores in the donor's body, leading to iron deficiency or anaemia. Iron is necessary for the production of new red blood cells, and a significant loss without adequate replenishment can result in fatigue, weakness, and other symptoms associated with anaemia.

#### 4) Psychological risks:

- a) Needle phobia and anxiety: Some potential donors may experience needle phobia or anxiety related to phlebotomy.

#### Risk factors and mitigation and prevention strategies

There are a range of characteristics which are associated with increased risk of complications from having blood taken. Some complications, such as fainting and needle site problems are more common based on gender. Body weight, baseline blood pressure and pre-existing anaemia are also factors (Wiersum-Osselton, et al. 2014).

To address the risks associated with phlebotomy, the protocol for taking blood needs to ensure the following:

- Blood not being taken from persons who have a body weight below a predetermined threshold
- Blood not being taken from anyone who have a blood pressure below predetermined threshold values
- Blood not being taken from people whose haemoglobin is below a certain threshold level (anaemia)
- Proper needle insertion technique. Healthcare professionals are trained to follow proper protocols to minimize the occurrence of discomfort, pain, and complications such as hematomas, bruising, damage to nearby tissues and infection.
- Adequate rest and refreshments. After phlebotomy, people are advised to rest, hydrate, and consume a balanced meal to minimize the risk of dizziness and lightheadedness.
- Iron supplementation. To prevent iron deficiency, people may be advised to take iron supplements or increase iron-rich food intake.
- Ensuring that appropriate psychological support is available for those with needle phobia or other anxiety issues.

#### Potential wider benefits from phlebotomy

There is some evidence that, when healthy people give blood, there are certain benefits to their health. This evidence is weak and insufficient to be important in decision-making but has been included here for completeness. A couple of studies have looked at whether phlebotomy can reduce liver damage in non-alcoholic fatty liver disease (a common illness of the liver) but it was not clear that there was real benefit (Kim and Oh 2016). Another small study (Zacharski, et al. 2008) looked at impact on cancer risk, and, while the findings are encouraging, there is not enough evidence to draw any conclusions. Several other conditions have been mooted that might be prevented or improved by phlebotomy, but there aren't clinical studies to support that sufficiently. They include: Alzheimer's disease (Dwyer, et al. 2009) and heart disease (Houschyar, et al. 2012).

#### References

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