

The art of

VENOUS BLOOD COLLECTION



Legal requirements

according to medical device regulations all necessary information, which is required for a safe application of the device needs to be provided by the manufacturer.

Therefore please refer to the current valid instructions for use!

Download from: www.gbo.com/preanalytics

Phlebotomy – the drawing of blood



...is one of the most common invasive procedures in health care. Each step in the process of phlebotomy affects the quality of the specimen and is thus important for preventing laboratory error, patient injury and even death.



Definition according to WHO, 2010, p. xiii



Guidelines

- Outline "simple" but important steps that can make blood collection safer.
- Have been created to improve the quality of blood samples and the safety of medical staff and patients during blood collection by promoting best practice.

This presentation is mainly based on

- WHO guidelines on drawing blood
best practices in phlebotomy WHO (2010)
- CLSI standards
GP41 Collection of Diagnostic Venous Blood Specimens; 7th Edition. CLSI (2017)
- Phlebotomy Essentials
McCall R.; Tankersley C. M.; 6th Edition (2016)
- Greiner Bio-One's expertise

An attempt at combining the literature on blood collection listed above and summarising it in a **logical, practical guide.**

The quality of the blood sample depends on many factors

- **SKILLS** of the staff collecting the blood sample
- Correct **PRODUCT SELECTION**
- Correct **VEIN SELECTION**
- Selection of the correct **BLOOD COLLECTION TUBE**
- Patient **IDENTIFICATION** and accurate labelling
- Transportation conditions
- Interpretation of the laboratory parameters, etc.



Influencing factors

PHYSIOLOGICAL FACTORS INFLUENCE LABORATORY PARAMETERS

and must be taken into consideration
and discussed with the doctor.

These include:

- Activity
- Food intake
- Medication
- Circadian rhythm (daily rhythm)
- Patient position



19 steps of blood collection

As a summary of the literature mentioned earlier, Greiner Bio-One recommends the following procedure



1

Physician's
instruction

2

Assemble
products

3

Hand hygiene

4

Contact,
patient
identification
and discussion

19 steps of blood collection

As a summary of the literature mentioned earlier, Greiner Bio-One recommends the following procedure



5

Position
patient

6

Select the
puncture site

7

Hand hygiene,
put on gloves

8

Product selection
based on the
patient

19 steps of blood collection

As a summary of the literature mentioned earlier, Greiner Bio-One recommends the following procedure



9

Disinfect the
puncture site



10

Apply a tourniquet



11

Venepuncture



12

Fill the tube

19 steps of blood collection

As a summary of the literature mentioned earlier, Greiner Bio-One recommends the following procedure



13

Release
the tourniquet

14

Take samples
observing the
correct order of
draw

15

Withdraw and
dispose of the
needle

16

Label the tube

19 steps of blood collection

As a summary of the literature mentioned earlier, Greiner Bio-One recommends the following procedure



17

Cleaning and
wound dressing

18

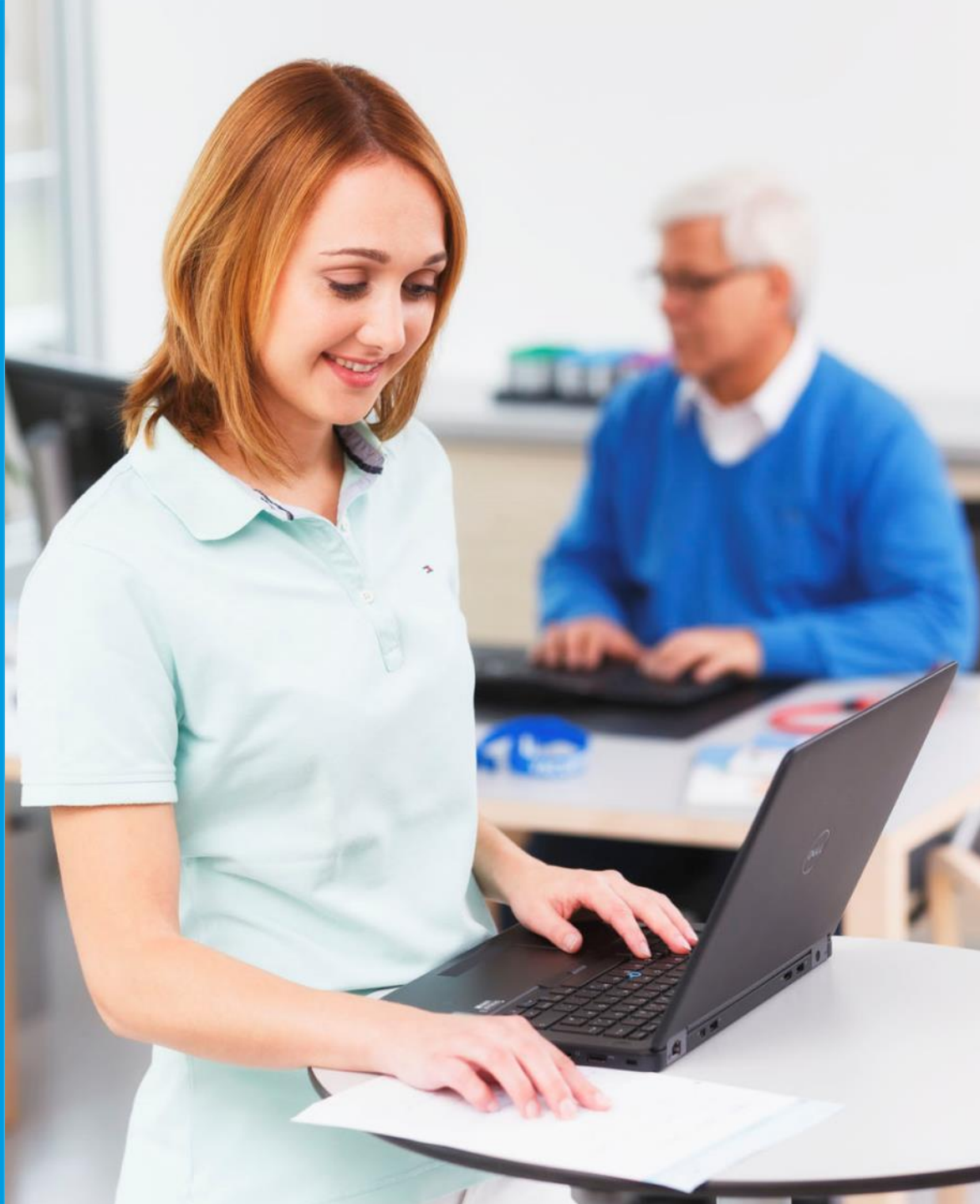
Special handling
recommendations

19

Farewell,
disposal,
cleaning,
hand disinfection

01

Physician's instruction



01 Physician's instruction

This is received in the form of a **WRITTEN** request document or via an LIS (Laboratory Information System).

The physician's instruction includes specifications from the laboratory on preanalytics and proper blood collection.



02

Assemble products



02 Assemble products

Ensure all the required products
(in their various versions)
and safety equipment are available.

Different patients require:

- Different **BLOOD COLLECTION SYSTEMS**
e.g. **VACUETTE® QUICKSHIELD** (Complete), safety blood collection set
- **NEEDLES** of various sizes and lengths
- **VACUETTE® BLOOD COLLECTION TUBE**
in various versions
- Various **ACCESSORIES**
e.g. sharps container, tourniquets



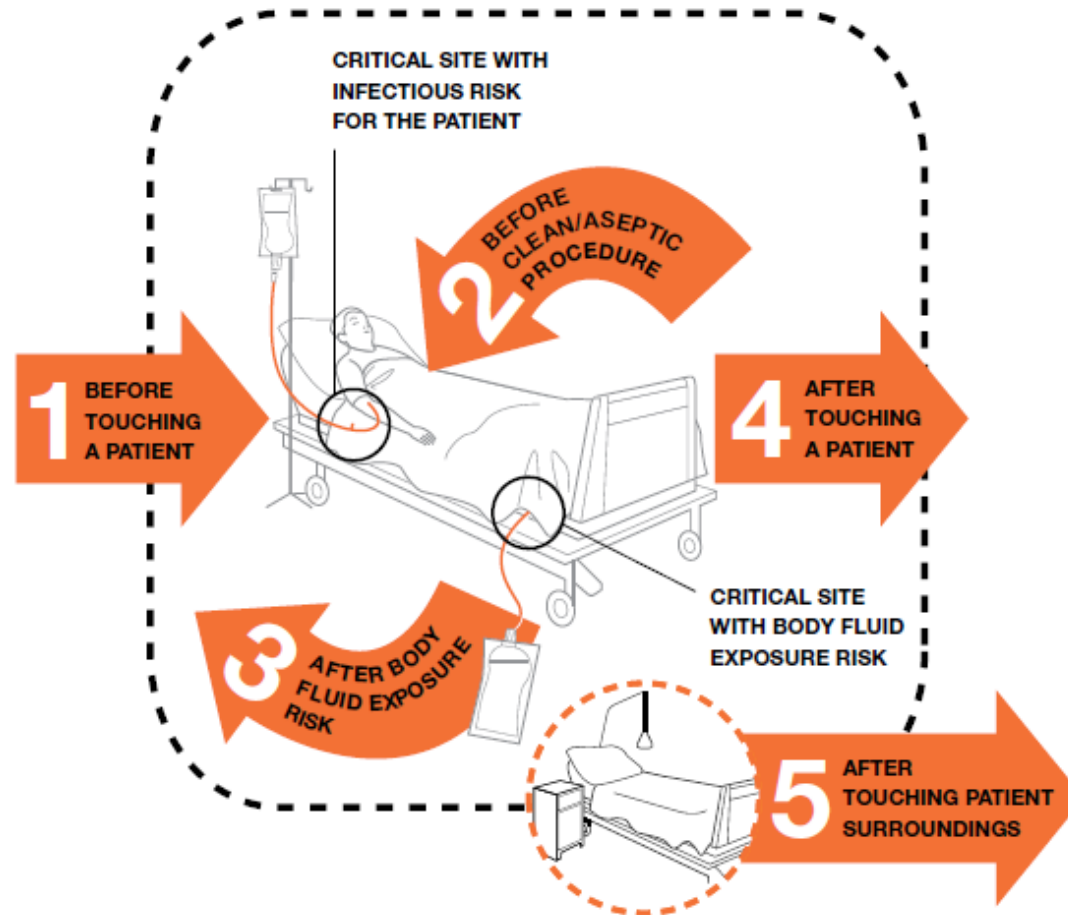
03

Hand hygiene



03 Hand hygiene

The 5 moments for hand hygiene



04

Discussion with patient



04 Discussion with patient

- **INTRODUCTION** to the patient
- Match laboratory form with **IDENTITY**
- Gather information on **DIET**, **ALLERGIES** (latex) and the patient's experiences
- Address any **FEARS** and experiences and respond appropriately
- Discuss the test that is going to be performed
- Obtain **CONSENT**



GBO TIP



IDENTIFYING THE PATIENT:

Patients should state their first name and surname themselves.

CLARIFY:

Sobriety and use of medication



05

**Position
patient**



05 Position the patient

Patient position

- Either in a **SITTING OR LYING** position
- A blood sampling chair with arm rests supports the patient's arm, and enables a patient who is collapsing to be positioned appropriately and protects them from falling.



06

Select the
puncture site



06 Puncture sites Priority list

(shown here using VeinViewer®)



1 Antecubital
fossa



2 Back of the
hand



3 Alternative
puncture
sites*

* Requires special knowledge,
consult the doctor

06 Puncture sites

Optimal visibility of the veins

using the antecubital fossa as an example



Tourniquet
not necessary
for prominent veins



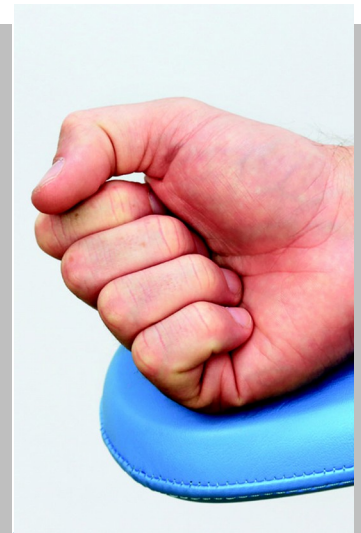
Slightly bent
arm



Position on
arm rest



Pull the skin
taut



Poss. ball the
hand into a fist
do not pump

GBO TIP



TOURNIQUET PRESSURE

A tourniquet pressure of **40 mm Hg** does not impair the arterial blood supply.

The vein to be punctured is well filled and therefore easy to palpate.

mmHg

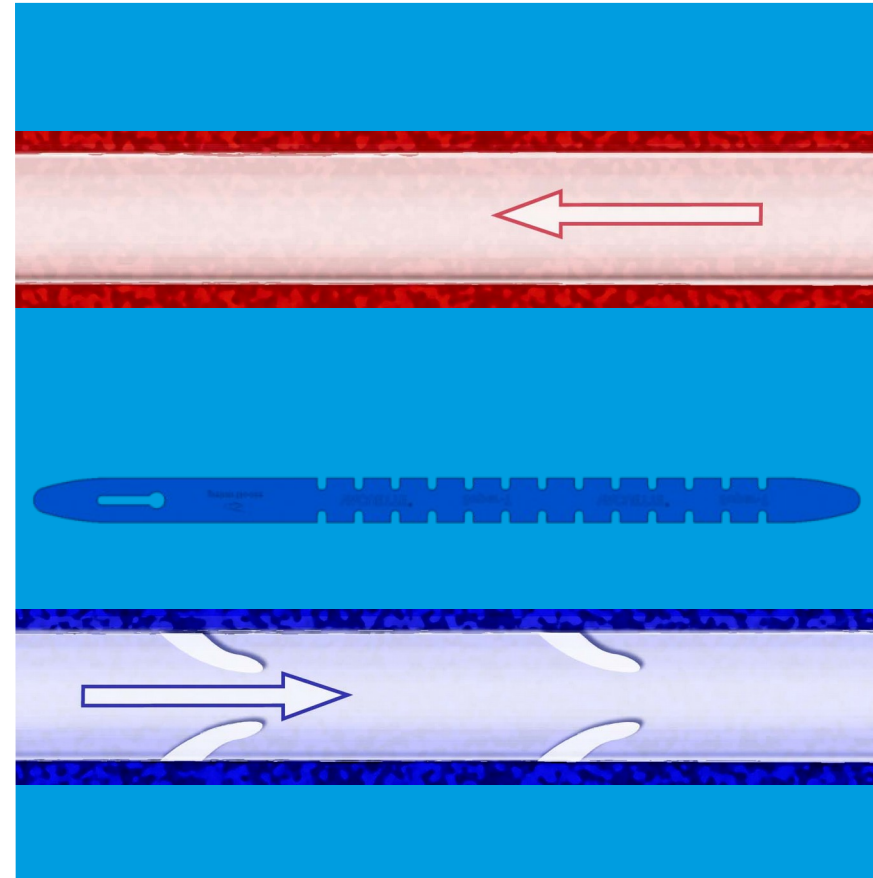
120

80

40

20

-5



06 Select the puncture site



Tourniquet

- Apply a tourniquet far enough away from the puncture site so as not to impede the subsequent steps
- Do not apply the tourniquet for longer than **ONE MINUTE**

06 Select the puncture site



Palpating the vein

To localise a vein, the area is palpated with the index finger. The following information influences product selection:

- **COURSE** of the vein and localisation of the puncture site
- **VEIN CONDITION**
(springy, elastic)
- **SIZE, DEPTH AND ORIENTATION**

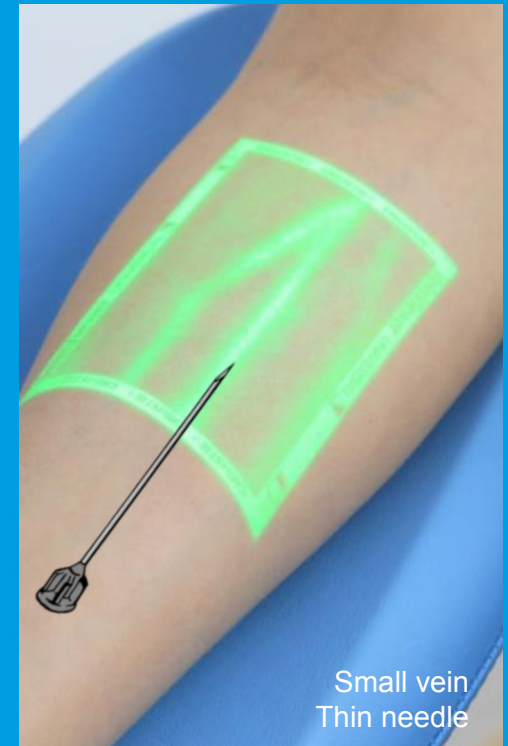
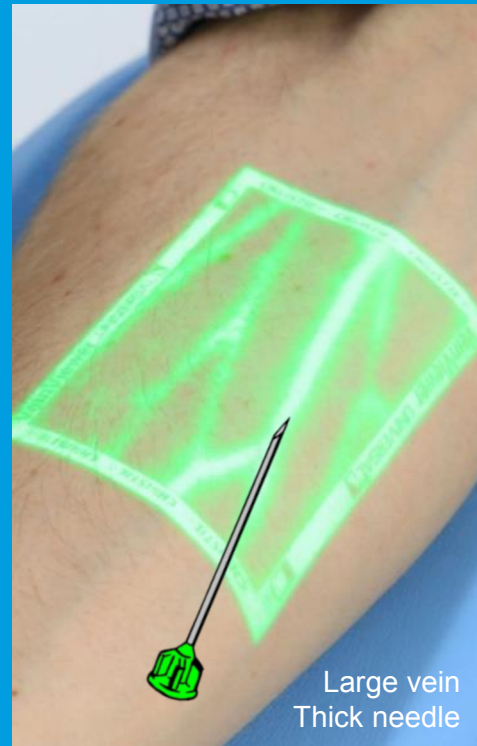
THE TOURNIQUET CAN NOW BE RELEASED.

GBO TIP



The **COURSE OF THE VEIN** influences the **ORIENTATION AND POSITIONING** of the person having the blood sample taken.

SIZE AND DEPTH of the vein influence product selection and the choice of **NEEDLE SIZE**.



07

**Hand hygiene
and putting on
gloves**



08

**Product
selection &
preparation
based on the
patient**



08 Product selection & preparation based on the patient

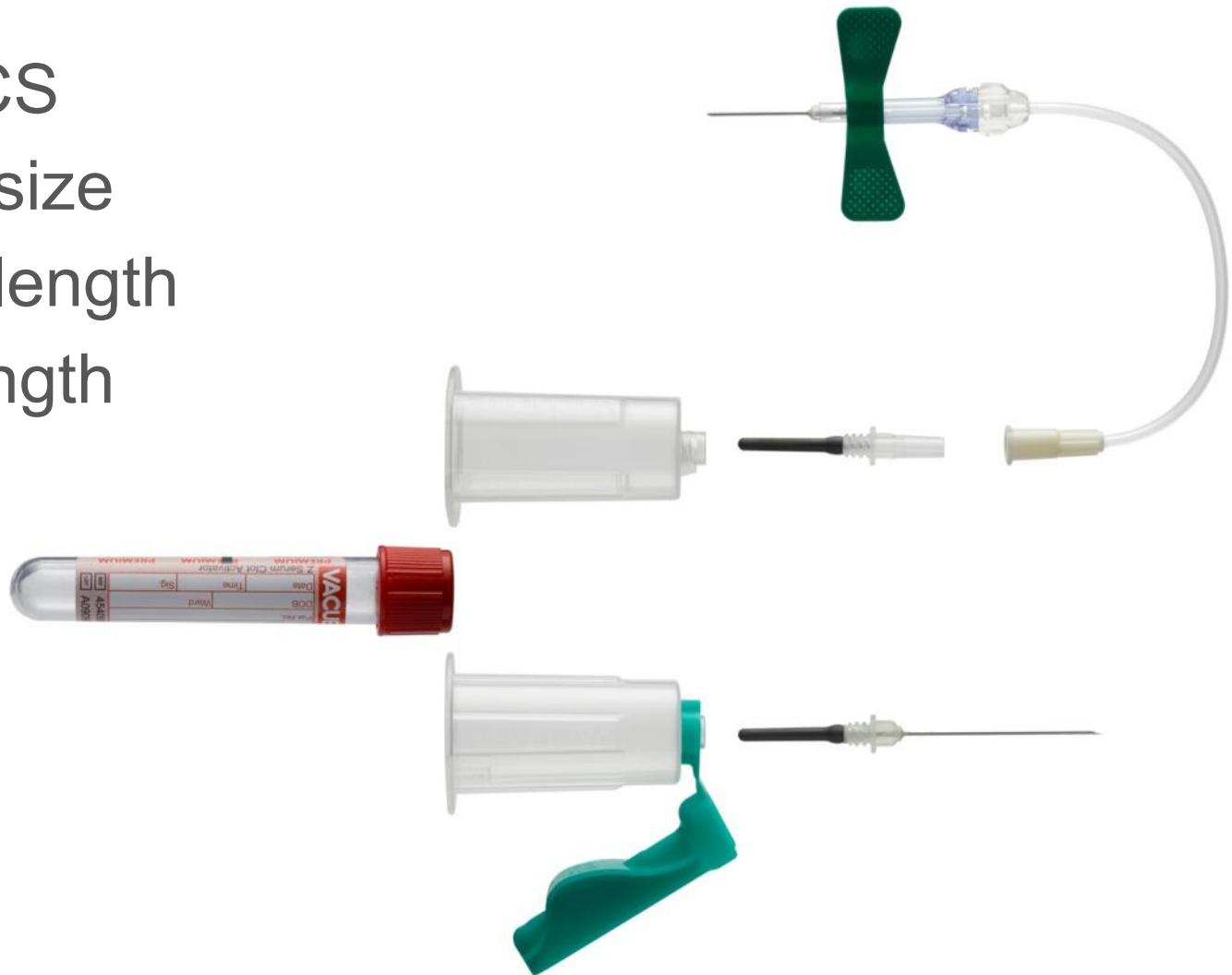
The **EXTENSIVE PRODUCT RANGE** from Greiner Bio-One provides an **OPTIMAL SELECTION** for a wide variety of venous conditions.

The next few slides show a selection of these products:

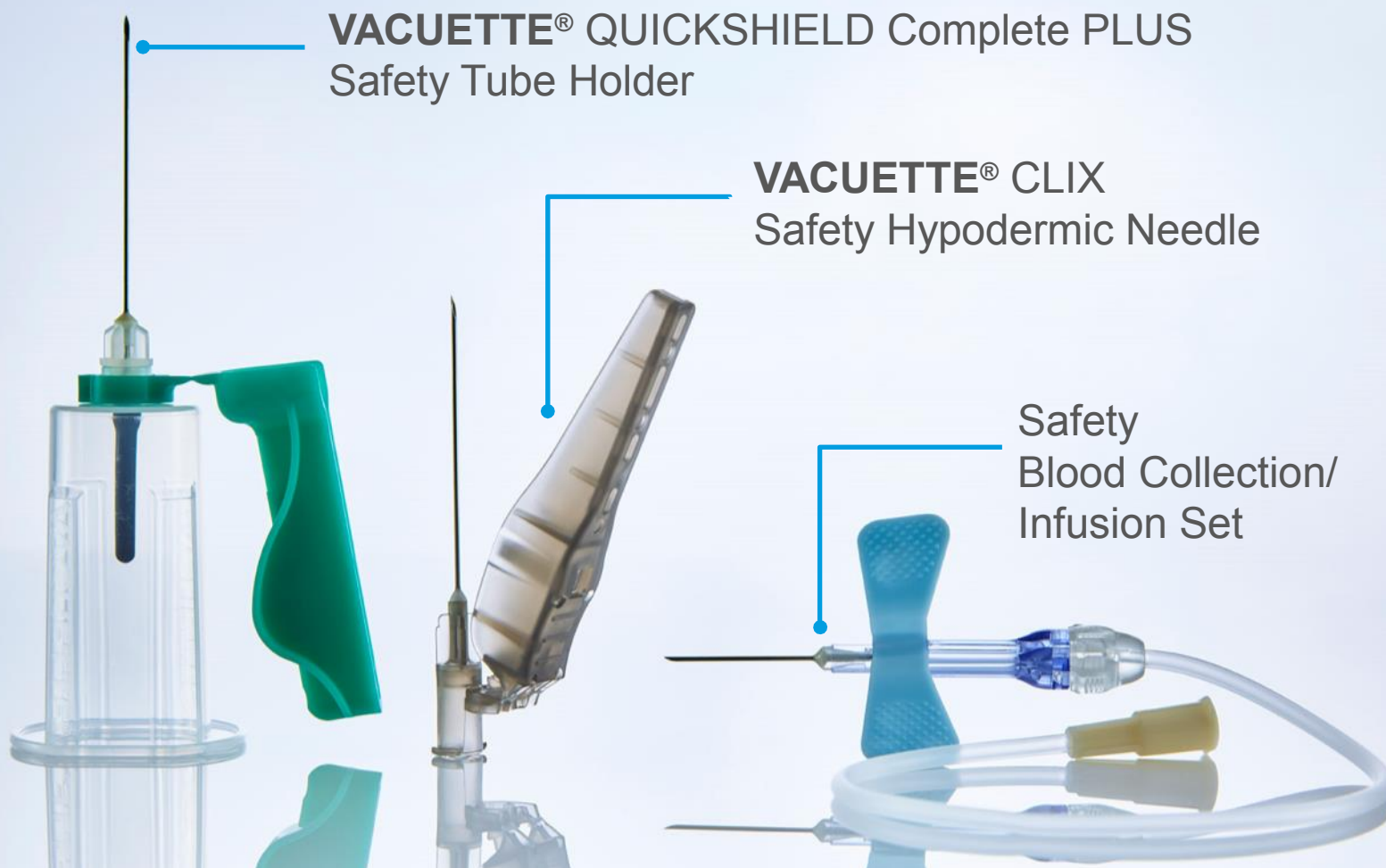


Options

- QS/SBCS
- Needle size
- Needle length
- Tube length



Safety products from Greiner Bio-One



VACUETTE® QUICKSHIELD

VARIANTS OF THE VACUETTE® QUICKSHIELD

- Safety Tube Holder
- Combination product pre-assembled with VISIO PLUS multiple-use drawing needles
- Combination product pre-assembled with standard **VACUETTE®** needles



VACUETTE® CLIX

Safety Hypodermic Needle

The **VACUETTE® CLIX** Safety Hypodermic Needle can be used both for **VENOUS BLOOD COLLECTION** as well as **INJECTION**.
There is a wide range of products available, including different needle sizes and lengths.



SAFETY blood collection set

VARIOUS PRODUCTS AVAILABLE:

combined with different tubing lengths and needle lengths and sizes

- SAFETY blood collection/infusion set without Luer adapter
- SAFETY blood collection set with Luer adapter
- SAFETY blood collection set with holder
- SAFETY blood collection set with blood culture holder



VACUETTE® Blood Collection Tube

Greiner Bio-One has a full range of
VACUUM BLOOD COLLECTION TUBES:

from coagulation tubes,
and serum and EDTA tubes
to a variety of special products.



GBO TIP



Using **LOW-VOLUME
TUBES** can prevent
iatrogenic anaemia.



Products from Greiner Bio-One

...are available in different combinations,
and are provided as sterile products in a practical packaging.



Create the ideal working conditions!

Right-handed users place
the blood collection system
and the disposal container
ON THE RIGHT.

The strap of the tourniquet,
the blood collection tube
and the swab
ON THE LEFT.



09

**Disinfect the
puncture site**



09 Disinfect the puncture site

- **IMMEDIATELY**
before inserting the needle
- observe the (minimum)
time required for drying -
refer to the manufacturer's
INSTRUCTIONS FOR USE



10

**Apply a
tourniquet
again**



VACUETTE®
Disposable Tourniquet

10 Optimal visibility of the veins

using the antecubital fossa as an example



Tourniquet
not necessary
for prominent veins



**Pull the skin
taut**



**Poss. ball the
hand into a fist**
do not pump

11

Venepuncture



11 Venepuncture

The skin and the vein are held in place by **PULLING THEM TAUT WITH THE THUMB.**

This enables the skin to be penetrated in the correct place and prevents the vein from "rolling away" from the needle.



11

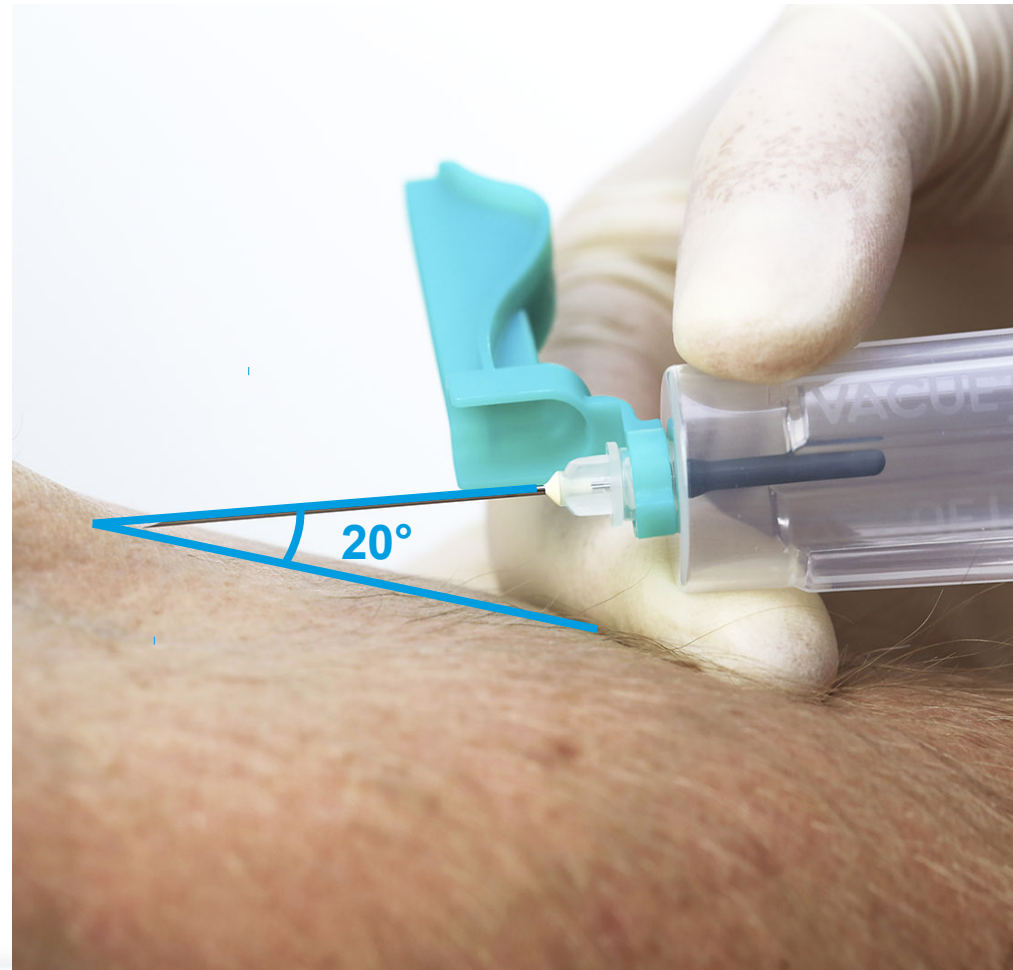
Venepuncture

L-SHAPED GRIP



11 Venepuncture

- Injection angle
 ≤ 30 DEGREES
- **BEVEL OF THE NEEDLE**
pointing upwards
- **THE INSERTION DEPTH VARIES** depending
on the patient and
vein selected



11 Venepuncture

- The adopted position now helps you **FOLLOW** the course of the vein
- The vein is punctured in **ONE** even **FORWARDS MOTION**.
- If the puncture is successful, when penetrating the vein wall you will feel **DECREASING RESISTANCE**.



GBO TIP



Use our **VACUETTE®**
VISIO PLUS needle
with transparent viewing
window to check the
puncture.



11 Venepuncture

The **BOTTOM OPENING** and the grips on the holder should be **EASILY ACCESSIBLE**.

The blood collection tube can then be inserted and withdrawn unhindered later on.



GBO TIP



Using your puncturing hand, take the holder between your thumb and index finger. Place your other fingers on the patient's arm to steady your hand. This will help you guide the holder and needle smoothly.

This prevents the needle from moving in the vein, which can cause pain/injuries.



12

Fill the tube



12 Fill the tube

Grip the holder with **THE INDEX FINGER AND MIDDLE FINGER** of your free hand positioned below the flanges for a firm hold when inserting the tube.

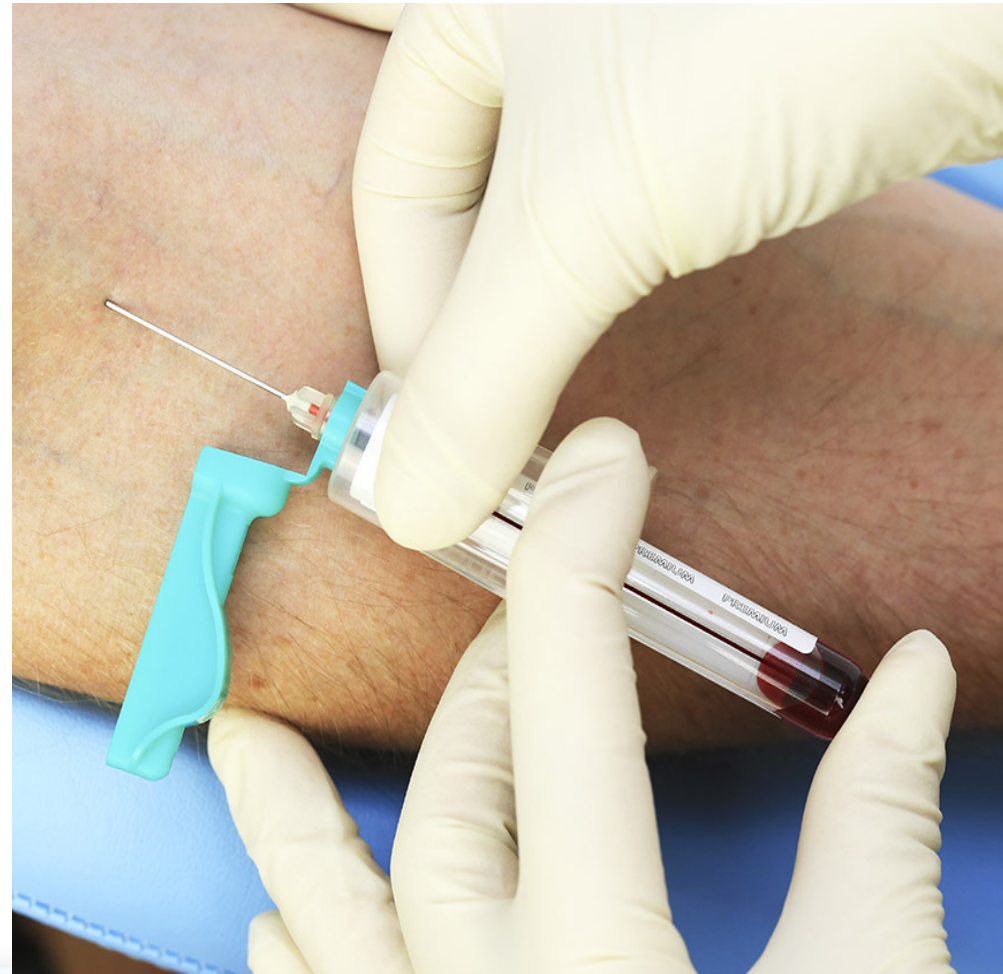
The tube is pushed into the holder with your **THUMB**.



12 Fill the tube

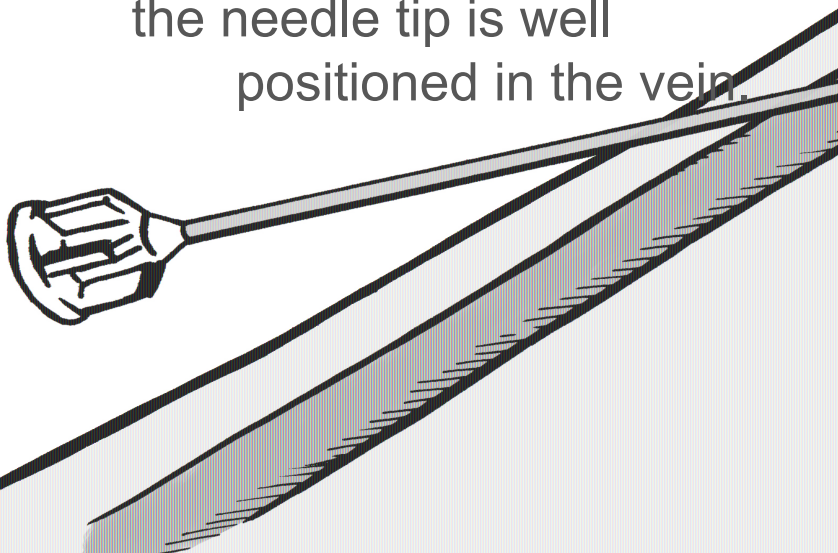
The tube is inserted in such a way that the **BLOOD FLOW CAN BE SEEN**.

If an identification label is applied to a tube, the label must not be positioned over the fill level mark and at least part of the tube must remain uncovered.



12 Fill the tube

If the tube is filled with blood
at a sufficient speed,
the needle tip is well
positioned in the vein.



12 Fill the tube

If blood is reluctant to flow into the tube or does not at all, this can be down to **VARIOUS CAUSES**.

Each situation requires an individual solution.



12 Fill the tube

In order to guarantee a steady needle position, the tube is pulled out of the holder **WITH A STEADY GRIP.**

This should prevent the needle moving around in the vein, which can cause pain.



13

Release the tourniquet

As soon as blood
flows into the
blood collection tube



14

Order of
draw,
inverting
the tube



14 Order of draw, inverting the tube



All others

If a safety blood collection set/blood collection set is used for blood collection,
and a citrate tube is collected as the first or only tube,
a tube without additives should be collected beforehand to avoid under-filling.

14 Order of draw, inverting the tube

Invert the tube

5-10x

after filling

Coagulation tubes

4-5x



15

**Withdraw
the needle,
secure and
dispose of it**



15 Withdraw the needle, secure and dispose of it

Apply a swab and remove
the puncture needle,
**WITHOUT APPLYING
PRESSURE** to the puncture
site under the swab.



GBO TIP



CAUTION!

If **PRESSURE** is applied to the puncture site when taking blood or withdrawing the needle, the **VEIN OR SKIN MAY BE SLASHED** and **PAIN** inflicted.



15 Withdraw the needle, secure and dispose of it

Immediately after withdrawing the needle, apply light **PRESSURE** to the wound for **3-5 MINUTES** to prevent a haematoma forming.

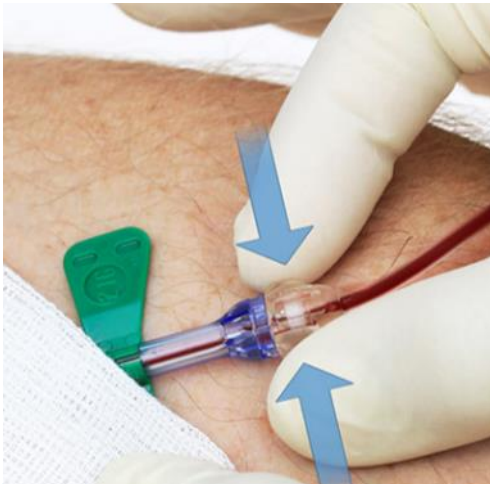
The arm should **NOT BE BENT**.

Patients can apply pressure themselves, as long as they are able to ensure that the pressure is sufficient.



15 Withdraw the needle, secure and dispose of it

SECURE the needle in accordance with the instructions for use



**SAFETY Blood
Collection Set**



**VACUETTE®
QUICKSHIELD**



**VACUETTE®
CLIX**
Safety Hypodermic Needle

15 Withdraw the needle, secure and dispose of it

Dispose of the product in the **SHARPS** container immediately.
Do not put it down anywhere else.



16

Label the
tube



16 Label the tube

Tubes must be identified by the

FOLLOWING INFORMATION

immediately after being filled
and in the presence of the
patient:

- First name and surname of the patient
- Patient ID
- Collection date and time
- Identity of the person who took the sample



GBO TIP



Alternative to labelling the tube:
**PRE-BARCODED BLOOD
COLLECTION TUBE**

In conjunction with "GeT":

- Information is also documented
- Errors are minimised
- The process is streamlined
- Traceability is guaranteed



17

Cleaning and wound dressing



17

Cleaning and wound dressing

As soon as the bleeding has stopped, a hypoallergenic **DRESSING** can be put on for **AT LEAST 15 MINUTES**.



18

**Special handling
recommendations
and transport**



18 Handling recommendations, transport

To ensure correct results, some samples need to be handled in a particular way. For example:

- **COOLED** to slow down the metabolic process
- Transported at **BODY TEMPERATURE** (37°C) to avoid precipitation or agglutination
- **PROTECT FROM SUNLIGHT** to avoid the breakdown of light-sensitive analytes

The transportation conditions stipulated by the laboratory must be complied with to guarantee the integrity of the sample.

19

**Farewell,
disposal,
cleaning and
hand disinfection**



References

- **CLSI. Collection of Diagnostic Venous Blood Specimens**
7th ed. CLSI standard GP41. Wayne, PA: Clinical and Laboratory Standards Institute; 2017
- **McCall R.; Tankersley C. M. (2016)**
Phlebotomy Essentials. 6th Edition, Philadelphia, Wolters Kluwer | Lippincott Williams & Wilkins
- **RKI (2011)**
Anforderungen an die Hygiene bei Punktionen und Injektionen. [Hygiene requirements for punctures and injections.] Springer-Verlag
- **WHO (2009)**
Hand Hygiene: Why, How & When? Geneva, WHO Library Cataloguing-in-Publication Data
- **WHO (2010)**
WHO guidelines on drawing blood: best practices in phlebotomy. Geneva, WHO Library Cataloguing-in-Publication Data
- **Legal texts**
Gesundheits- und Krankenpflegegesetz – GuKG (Health Care and Nursing Act), EUROPEAN COUNCIL DIRECTIVE 2010/32/EU, Strafgesetzbuch - StGB (Criminal Code)

YOUR POWER FOR HEALTH