



Central Laboratory

-From Specimen Reception to Reporting-

Bärbel Wilke
LKF

Central Laboratory Procedure

- Define the requirements on trial basis
- Define optimal supply
- Specimen collection and preparation
- Define shipment conditions
- Specimen accessioning and storage
- Reporting and data transfer

How to identify the individual needs?



- Protocol review
- Mono center or multi center trial?
- Timelines for inclusion of patients
- Distribution of countries and sites
- Special requirements for PK/BM?
- Pro-active communication with involved PK/BM labs
- Collection of stability data, decision of transport temperature and frequency
- Declaration of shipped material, packaging guidelines
- Reporting/data transfer requirements
- Central storage

Mono center trial



History of Laboratory Medicine

(15th Century)

- Well trained Phase I Units
- Standardized processes are established
- SOPs are available
- High acceptance to implement new and complicate procedures
- Cooling centrifuges are no problem
- Freezers up to -80°C available
- Temperature control no problem

Multi center trials

So many countries, sites and patients! Different levels of understanding



More difficult to implement complicated procedures, equipment could be an issue. To follow guidelines which differs from routine might create error situation.

Lab Supply

Lab Material



Individual Lab Manual

-including details about pre-analytical requirements

Visit specific lab kits

Shipment material

Pre-labeled storage boxes

Study specific labels

Study specific storage lists

PK/BM lab specific lists

Centrifuge?

Freezer?

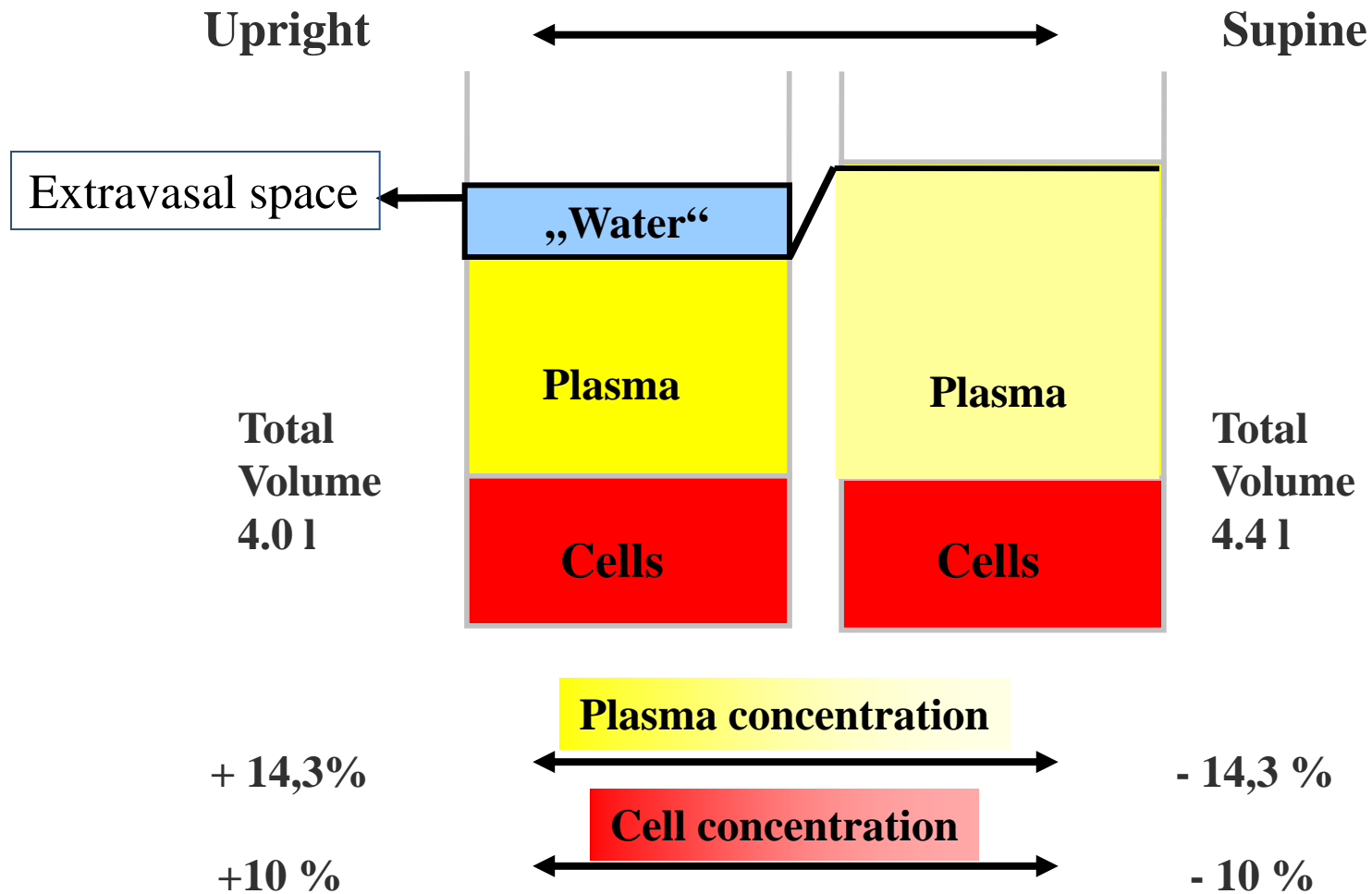
Composition of kits by central lab

| Additive | Effect | Color | | Analyses |
|----------------------|-----------------------------------|-------------------|------------------|------------------------------|
| | | <i>Vacutainer</i> | <i>Monovette</i> | |
| No | No | red | white | Biochemistry, Serology |
| Heparin | Thrombin Inhibition | green | orange | PK, Biochemistry |
| EDTA | Ca-Binding | lavender | red | Hematology |
| Citrate | Ca-Binding | blue | green | Coagulation |
| Fluoride/ Oxalate | Ca-Binding/ Enolase-Inhibition | grey | yellow | Glucose, Alcohol, Lactate |

Recommendations for blood collection

- **Supine or sitting position for 10 min.**
- **Tourniquet not longer than 1 min.**
- **No fist clenching**
- **No handgrip exercise**
- **Open tourniquet before aspiration**

The posture affects the intravasal blood volume



Effect of blood sampling conditions

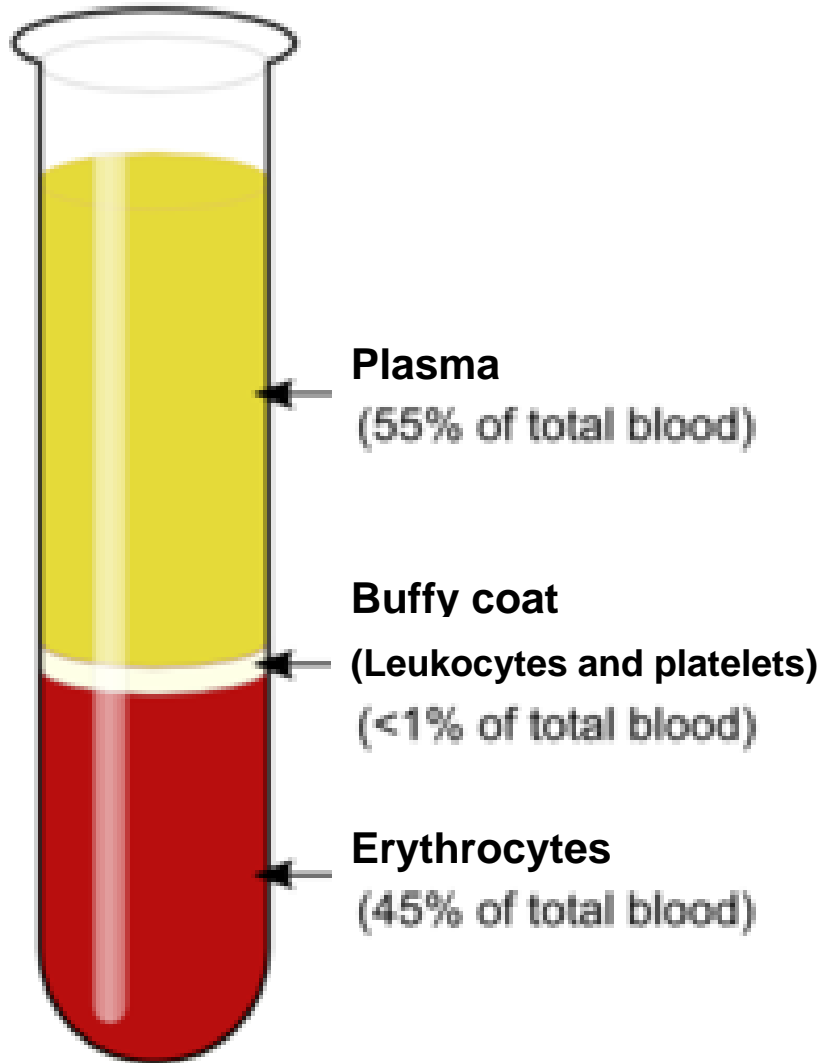
Example: Cholesterol

| | | |
|--------------------|---------------------|----------------------|
| Position: | Supine (15') | 189 mg/dL |
| Tourniquet: | no | (4,86 mmol/L) |

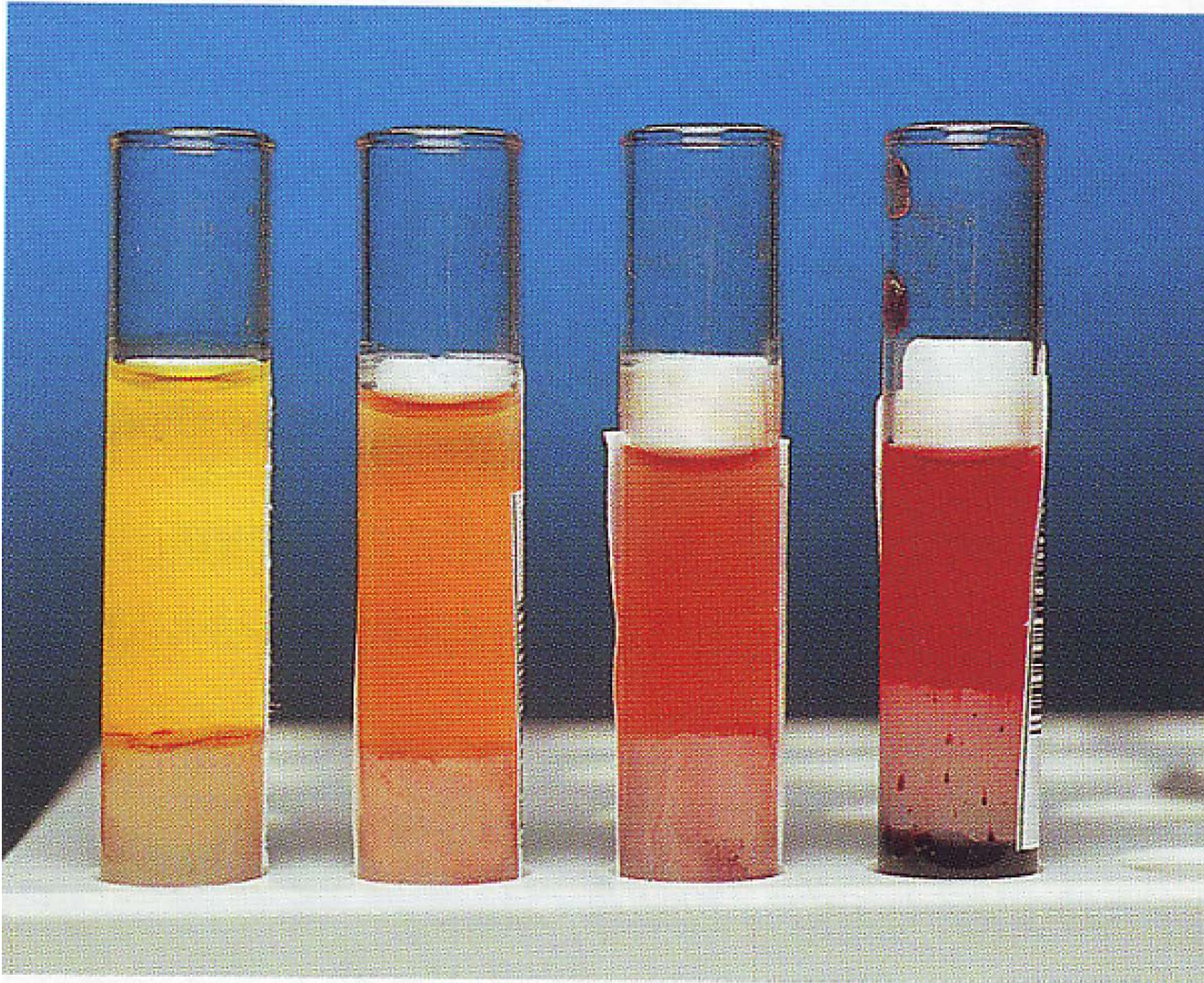
| | | |
|--------------------|----------------|----------------------|
| Position: | Upright | 242 mg/dL |
| Tourniquet: | 5 min. | (6,23 mmol/L) |

Difference: +22%

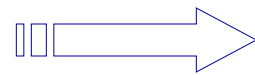
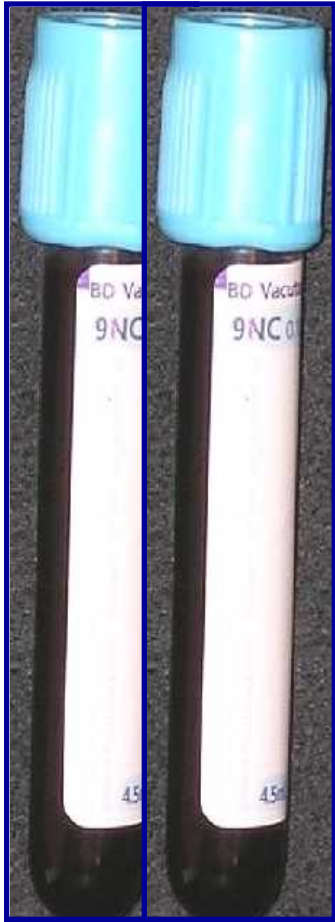
Pre-Analysis: Buffy Coat



Hemolyses



Instruction with pictures and color-codes



**centrifugation
within 30 minutes**

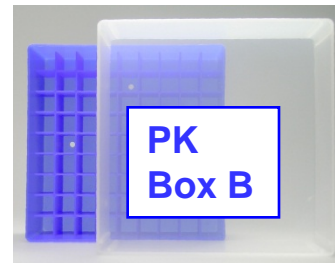
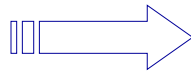
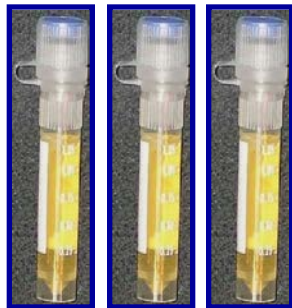
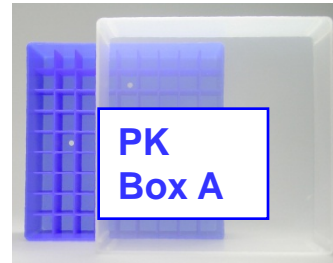
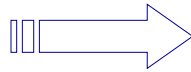


**transfer of
0.5 ml supernatant
Into 6 tubes**

**store 3 tubes in box A
store 3 tubes in box B**



How to reduce queries and mix-up



Store until
pick up



Standardization

**Centrifugation speed and time
Identical volumes per aliquot!
Same color codes!**

**Two separate storage boxes!
Two identifiers only (eg: Screening number)**

Choose the right courier!



Biological specimens are not dangerous goods

Verpackungsvorschriften

VERPACKUNGSVORSCHRIFT 650

Diese Vorschrift bezieht sich auf UN 3373, auf Passagier und Frachtflugzeugen und Nur Frachtflugzeugen.

Allgemeine Anforderungen Die Verpackungen müssen von guter Qualität sein, stark genug um Stößen und Belastungen, wie sie während dem Transport einschliesslich dem Übertrag zwischen verschiedenen Transporteinheiten und zwischen Transporteinheiten und Lagerhäusern sowie beim Entladen von Paletten oder Umverpackungen zur manuellen oder mechanischen Weiterbehandlung, normalerweise auftreten, zu widerstehen. Verpackungen müssen so gebaut und verschlossen sein, dass unter normalen Transportbedingungen kein Verlust des Inhalts durch Vibrationen oder durch Temperatur-, Feuchtigkeit- oder Druck-Änderungen eintritt.

Die Verpackung muss aus drei Komponenten bestehen:

- (a) ein Primärbehälter;
- (b) eine Sekundärverpackung; und
- (c) eine starke Aussenverpackung.

Primärbehälter müssen so in Sekundärverpackungen verpackt sein, dass sie unter normalen Transportbedingungen, nicht zerbrechen, durchstossen werden können oder deren Inhalt nicht in die Sekundärverpackung austreten kann. Sekundärverpackungen müssen mit Polstermaterial sicher in der Aussenverpackung befestigt sein. Ein Austreten des Inhalts darf die Schutzeigenschaften des Polstermaterials oder der Aussenverpackung nicht beeinträchtigen.



Biological specimens are categorized as
Risk group 2-3 (WHO)

Declaration
UN 3373 Biological Substance Cat. B



Country distribution – more or less problematic

| | | | | |
|-----------------|----------|------------------|---------|---------|
| Germany | Spain | USA | Ukraine | China |
| Skandinavia | Italy | Canarian Islands | Russia | Belarus |
| Poland | Romania | Argentina | Brazil | Georgia |
| The Netherlands | Bulgaria | Peru | Mexico | |
| Belgium | | | Taiwan | |
| France | | | Georgia | |
| UK | | | Turky | |
| Lithuania | | | India | |
| | | | Egypt | |

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Easy

Difficult

Costs increase accordingly

Temperature – more or less problematic

Ambient

Not controlled!
5°C – 30°C

Frozen

-20°C bis -70°C

Cooled

2 bis 8°C

Liquid Nitrogen

≤ -190°C

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Easy

Difficult

Costs increase accordingly

Cheap solutions to check temperature

Electronic data logger or
Temperature indicator (Chill Checker)



What to do with deviations?
Temperature control without defined
ranges is not recommended!



Establish an active tracking system

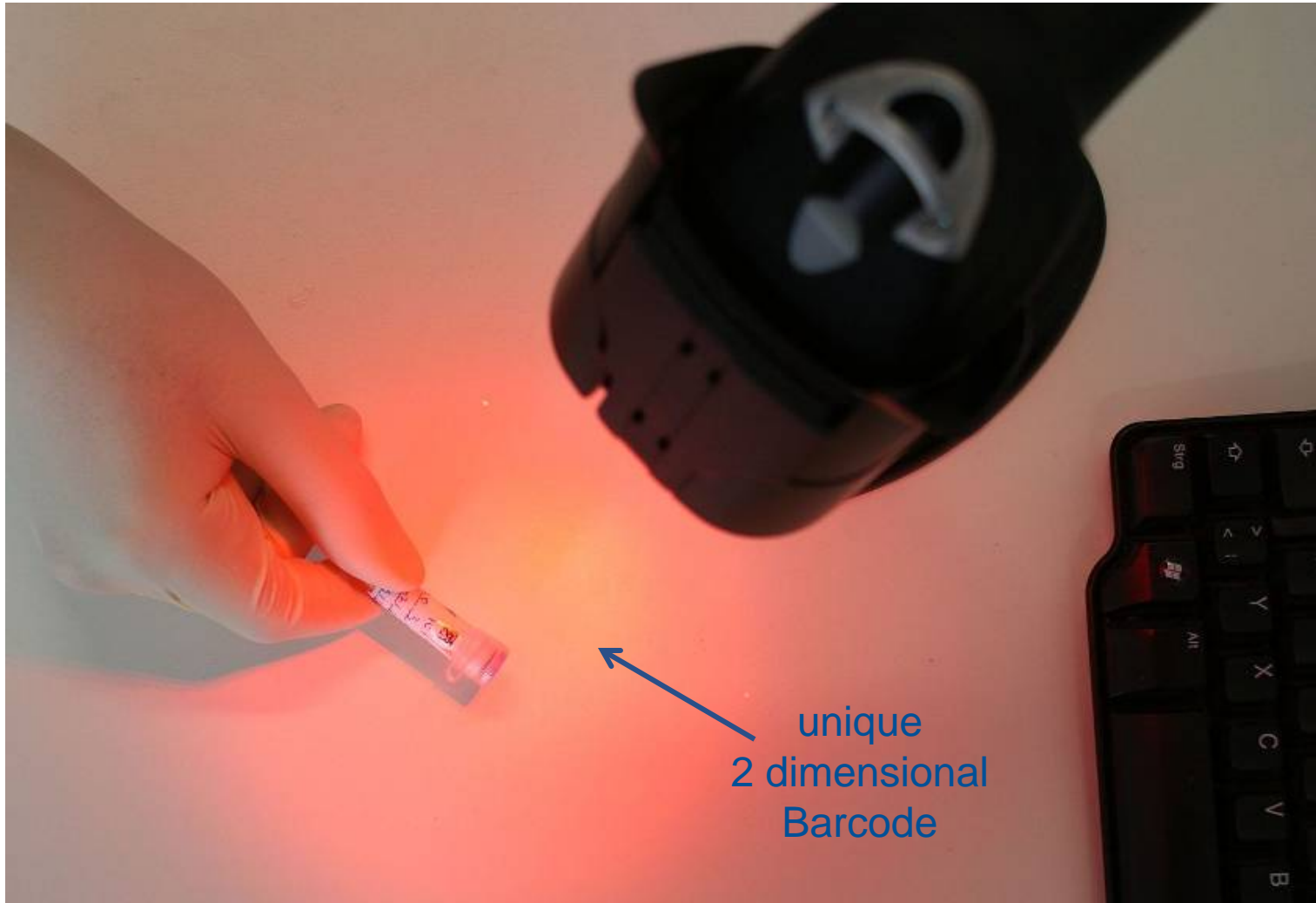
| Trial | Site | Name | Sampling | Schedule | Country | Courier | AWB | Patient |
|-----------|------|-----------|----------|----------|---------|---------|------------|------------|
| Example 1 | 0512 | Example 1 | 19.03.13 | -1 | B | DHL | 9949597453 | 0000051203 |
| Example 2 | 0122 | Example 2 | 21.03.13 | 1 | SK | DHL | 9934158235 | 0000012206 |
| Example 3 | 7304 | Example 3 | 21.03.13 | 1 | PL | DHL | 9748583262 | 0000730408 |
| Example 1 | 0072 | Example 4 | 21.03.13 | 1 | PL | DHL | 9388574628 | 0000072011 |
| Example 2 | 0071 | Example 5 | 21.03.13 | 1 | PL | DHL | 9948875235 | 0000071004 |
| Example 3 | 0401 | Example 6 | 20.03.13 | 1 | MAC | DHL | 9938476543 | 0000040114 |
| Example 1 | 0401 | Example 6 | 21.03.13 | 2 | MAC | DHL | 9718374654 | 0000040113 |

In time
No action

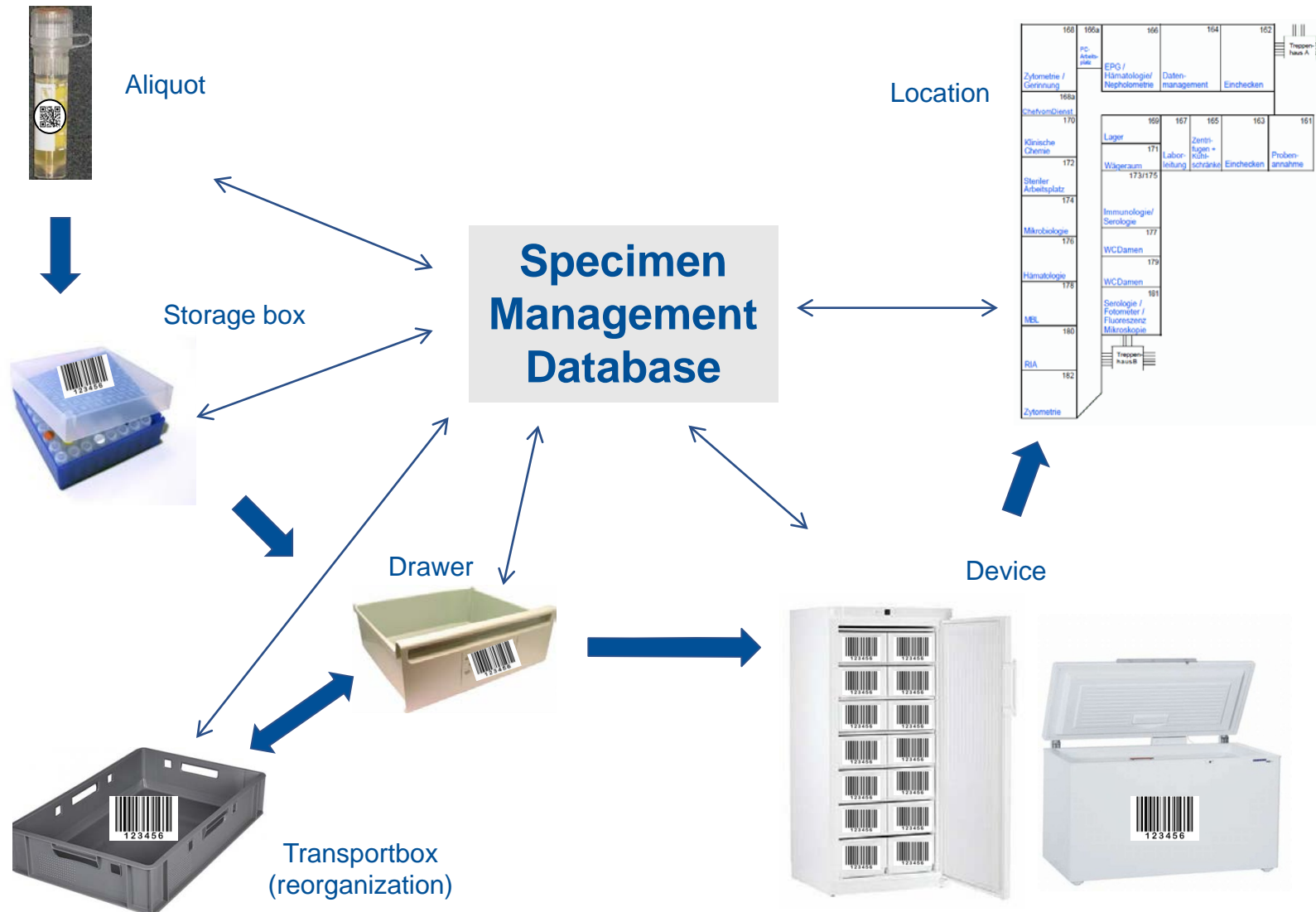
Delay
Contact the site/courier



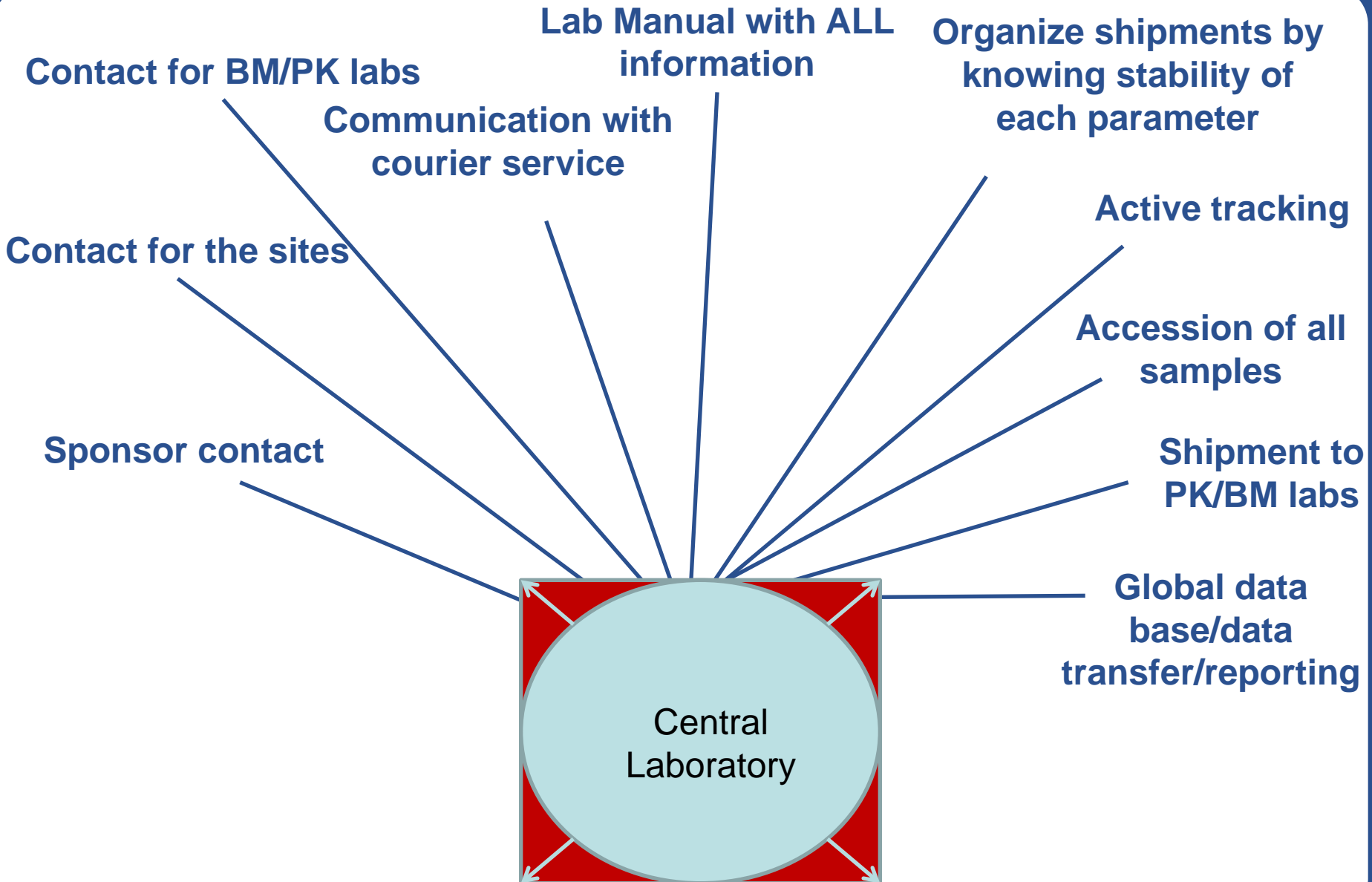
Scan of each individual sample aliquot



Specimen tracking database



Central laboratory assistance



A blue and white sailboat is sailing on a body of water. The boat has a tall mast with a white sail and a blue sail. A person is visible climbing the mast. In the background, a large suspension bridge with two tall towers is visible. The sky is overcast.

**Thank
you**

**Vielen
Dank**