

Y-site injection compatibility of parenteral medicines with balanced salt solutions

Background and Importance

Simultaneous administration of multiple infusion solutions via the same catheter lumen (Y-site administration) is not avoidable in clinical practice, especially in intensive care and oncology patients. However, information about Y-site compatibility is often not available. This is especially true for simultaneously administered balanced salt solutions (BSS), which are indicated for fluid therapy. Moreover, different types of BSS (brand)products contain different types and quantities of electrolytes.

The aim of this study was to evaluate and present compatibility information of commonly used parenteral medicines with different types of balanced salt solutions and Ringer's lactate injection during Y-site infusion (1:1 mixture). Monographs should be implemented in the ADKA-STABIL-Database.

Material and Methods

Admixture partners: Elektrolyt-Infusionslösung 153 (Burg Pharma), Jonosteril® (Fresenius Kabi), Normosol®-R (ICU Medical), Sterofundin® ISO (BBraun Melsungen), Ringer's lactate injection; 194 parenteral medicines

Searched databases: Summary of Product Characteristics, Stabilis®, Trissel's™ IV Compatibility, KIK (B.Braun), PubMed GoogleScholar; license holder's data on file

Method: Y-site compatibility information of 1:1 admixtures was categorized (in-/compatible, probably in-/compatible, contradictory) and compiled in table format. Detailed compatibility information is given in a pre-determined manner together with references in new monographs in the ADKA-STABIL-Database.

Results

Y-site compatibility information was retrieved for admixtures of BSS products with 97 out of the 194 parenteral medicines in question. Results are given in Table 1 referring to the different BSS brand products, colour coded compatibility categories, and references. For the other 97 medicinal products compatibility information was missing or contradictory. Monographs were implemented in the ADKA-STABIL-Database for Jonosteril®, Sterofundin® ISO and Ringer's lactate injection, encompassing 459 compatibility data sets (example see Figure 2).

Table 1: Y-site compatibility of balanced salt solutions and parenteral medicines; Reference [1] to [132] given in ADKA Stabil-Database

| Parallel infundiertes Arzneimittel/ Kombinationspartner als Wirkstoff | Balancierte Vollelektrolytlösungen | | | | | | | Ringer-Lactat-Lösung | | | | | |
|--|--|---|--|--|---|--|--|---|---------------------------------|----------------------|---|---|-----------------------|
| | Balancierte Vollelektrolytlösungen Allgemein, diverse Hersteller | | Sterofundin® ISO Infusionslösung BBraun | | Jonosteril® Infusionslösung, Fresenius Kabi D = Ringer-Acetat Infusionslösung, Fresenius Kabi CH | | Elektrolyt-Infusionslösung 153 BurgPharma | | Normosol® R ICU Medical | | Ringer-Lactat Infusionslösung diverse Hersteller | | |
| | (In)kompatibilitäten laut Fachinformation des parallel infundierten Arzneimittels | (In)kompatibilitäten laut Fachinformation der Infusionslösung | Originalliteratur | AID Klinik, KIK- Modul (Stand 08/2022) | (In)kompatibilitäten laut Fachinformation der Infusionslösung | Fresenius Kabi D, auf Anfrage 2022 | Fresenius Kabi CH, auf Anfrage 2023 | (In)kompatibilitäten laut Fachinformation der Infusionslösung | BurgPharma, auf Anfrage 2023 | Originalliteratur | (In)kompatibilitäten laut Fachinformation des parallel infundierten Arzneimittels | (In)kompatibilitäten laut Fachinformation der Infusionslösung | Originalliteratur |
| 5-Fluorouracil | ⊗ | ⊗ | Ca-chlorid [132] | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Ca-chlorid [55] | ⊗ | ⊗ | Ca-chlorid [132] |
| Acetylsalicylsäure | ⊗ | ⊗ | [1] | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Ringer Lactat Lösung | ⊗ | ⊗ | ⊗ |
| Aciclovir | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [3] |
| Alemtuzumab | ⊗ | ⊗ | ⊗ | IK nicht ausgeschlossen | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Alprostadil | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [54] |
| Amantadin(hemisulfat) | Keine IK bekannt | Sulfat-Anionen | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | keine IK bekannt | ⊗ | ⊗ |
| Aminoplasmal BBraun | Keine IK bekannt | Sulfat-Anionen | ⊗ | Gefahr einer IK | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Amiodaron(hydrochlorid) | nur G5% kompatibel | ⊗ | [1] | Na-acetat [58] | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [4] | nur G5% kompatibel | ⊗ | [3] |
| Amphotericin B, liposomal | Elektrolyte | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Elektrolyte | ⊗ | [3] |
| Ampicillin | ⊗ | ⊗ | [2] | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [3], [6] |
| Amsacrin | Cl-Anionen | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Cl-Anionen | ⊗ | [56] |
| Arsentrioxid | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [49] |
| Atezolizumab | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| ATG vom Kaninchen (Grafalon) | Nicht als IK angegeben | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Nicht als IK angegeben | ⊗ | ⊗ |
| ATG vom Pferd (Atgam) | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Atropin(sulfat) | Nicht als IK angegeben | Sulfat-Anionen | [2] | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Nicht als IK angegeben | ⊗ | [3], [55] |
| Bendamustin(hydrochlorid) | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Bleomycin(sulfat) | Ca-Kationen, Mg-Kationen | Sulfat-Anionen | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | Ca-Kationen | ⊗ | ⊗ |
| Blinatumomab | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | K-chlorid [57] |
| Bortezomib | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Brentuximab-Vedotin | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Calcitonin | Keine IK bekannt | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Calciumfolinat | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |
| Calciumgluconat | Nicht als IK angegeben | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [21] |
| Caplacizumab | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | [3], [59], [60], [61] |

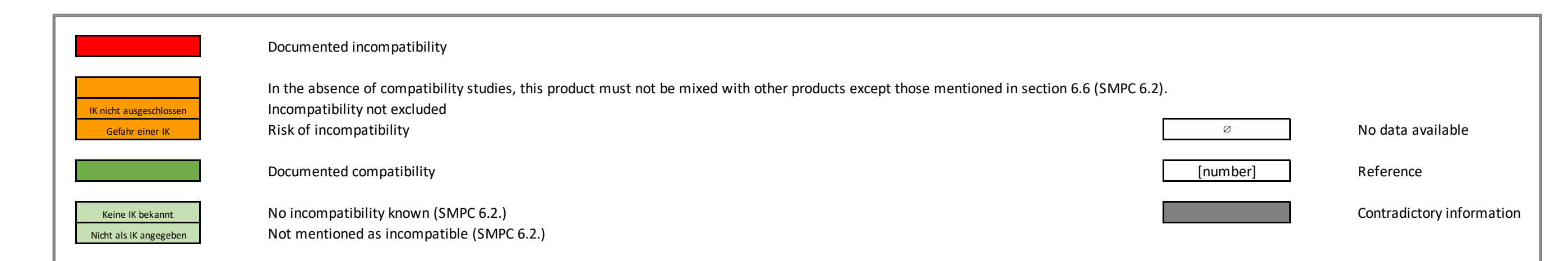


Figure 1: Legend

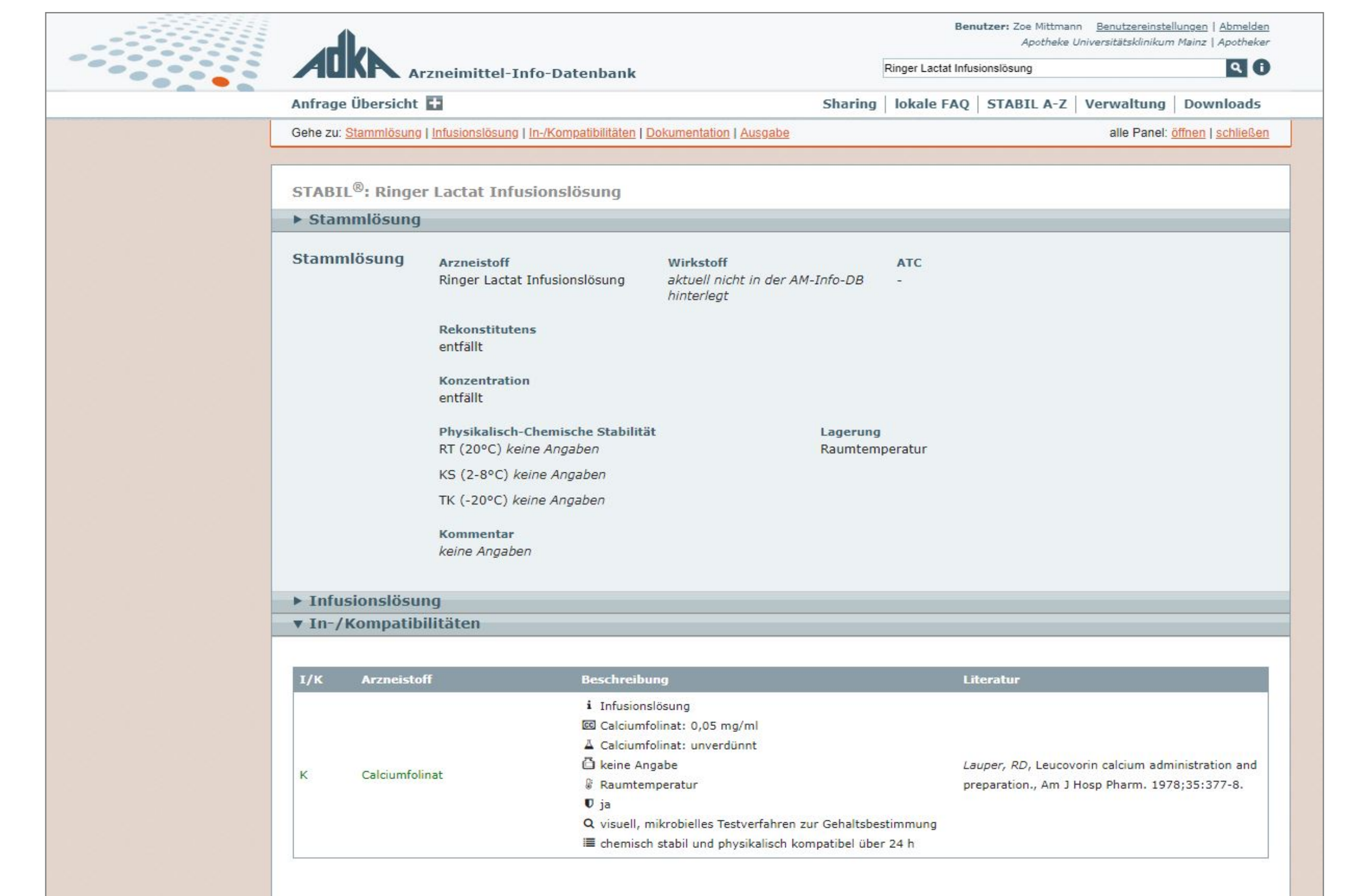


Figure 2: Example from the ADKA-STABIL Database: Monograph of Ringer's lactate infusion solution

Conclusion and Relevance

Although compatibility information based on experimental studies is limited for the different BSS-(brand)products, Y-site compatibility with 97 medicines was assessed. Detailed information is accessible in table format in an upcoming publication and in new monographs in the ADKA STABIL-Datenbank. Further experimental studies are required to complete missing compatibility information.