

C. Serrurier, J. Vigneron, I. May
Pharmacy department, University hospital, Nancy, France

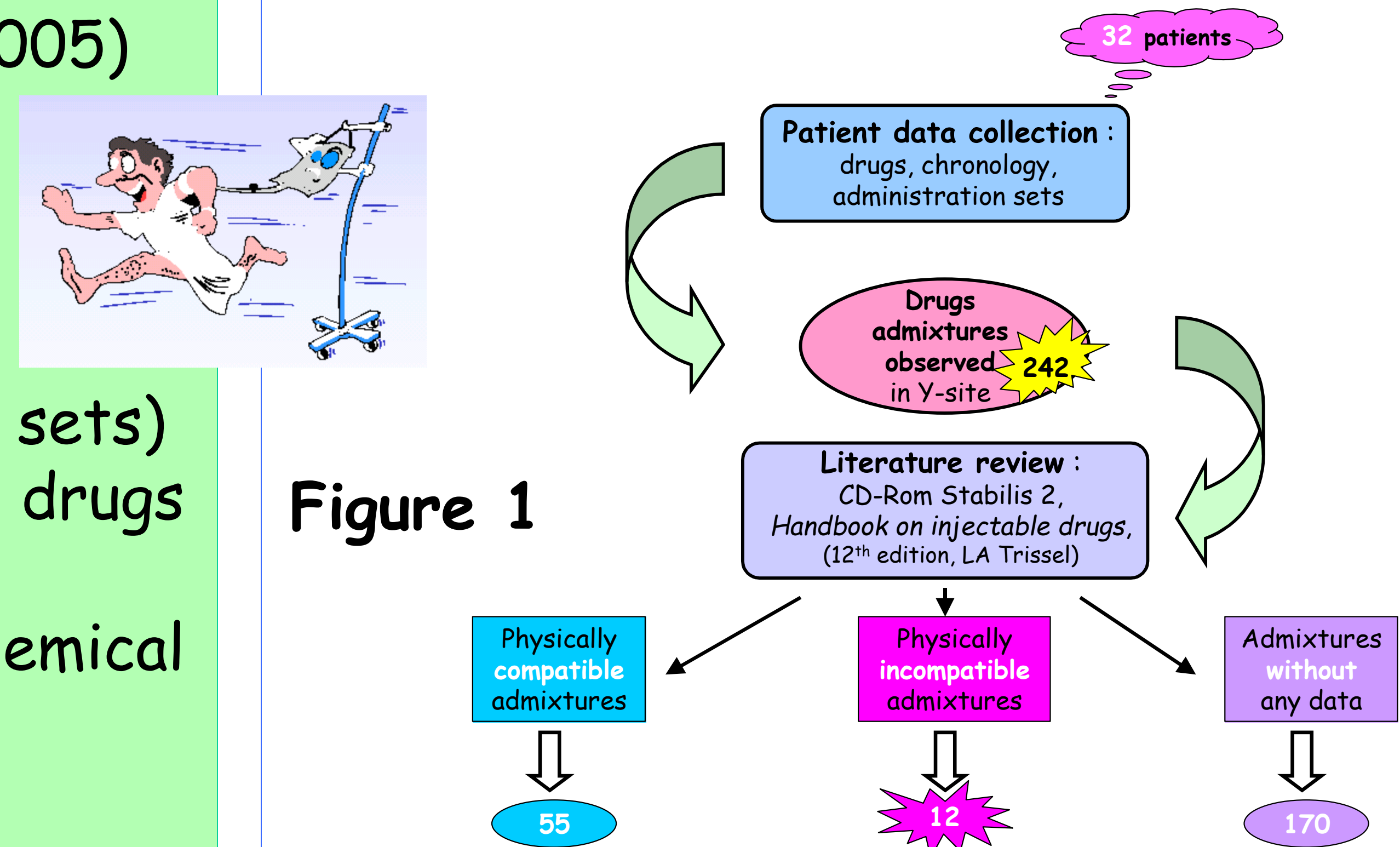
OBJECTIVES

In intensive care units, patients receive multiple injectable drugs through the same central venous access site, often simultaneously ; so many compatibility problems can occur.
Our objectives are to assess methods of injectable drugs administration and to determine potential physico-chemical incompatibilities by consulting literature: Stabilis 2 (International CD-Rom database) and Trissel's Handbook on Injectable drugs (12th edition).

METHOD

- ◆ **Design** : prospective study, during two months (February - March 2005)
- ◆ **Setting** : two intensive care units of our university hospital
- ◆ **Study (Figure 1)** :
 - collection of patient data (drugs, chronology, administration sets)
 - realization of administration drawing to determine the drugs admixtures in Y-site (Figures 2 and 3)
 - review of the literature to determine potential physico-chemical incompatibilities

RESULTS - DISCUSSION



The figures 2 and 3 present two administration drawing.

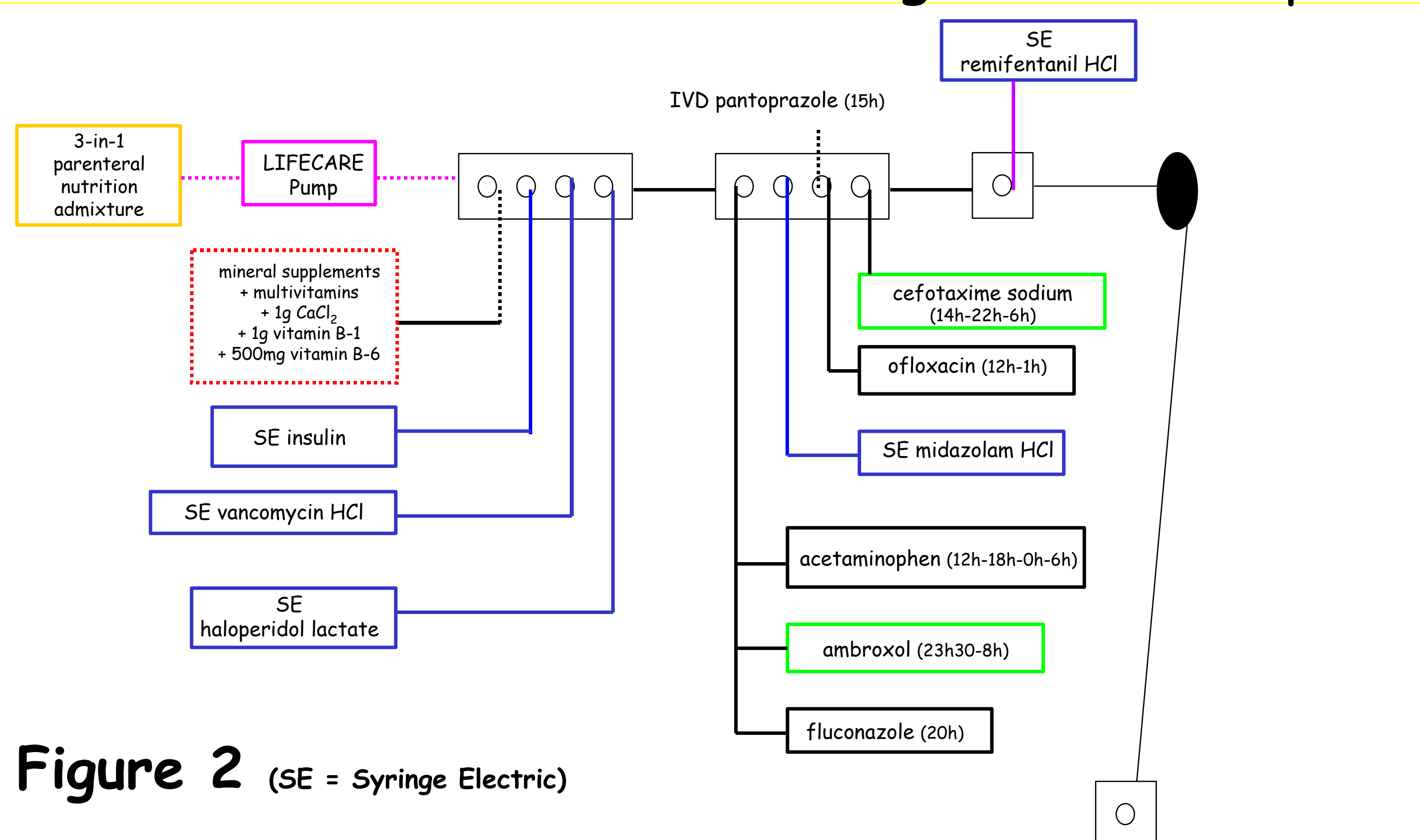


Figure 2 (SE = Syringe Electric)

On the figure 2, we observed **33** different drugs mixtures:
- **7** physically compatible
- **24** without any data in the literature
- **2** physical incompatibilities appearing by a precipitate: haloperidol lactate + fluconazole and vancomycin HCl + cefotaxime sodium.

The most important observation on this drawing is the use of the 3-in-1 parenteral nutrition admixture to push the whole of the program whereas the proximale line is free. To connect the parenteral nutrition on the free line and stop this infusion if an emergency administration (vasopressive amines, ...) is required is the most pharmaceutically acceptable solution.

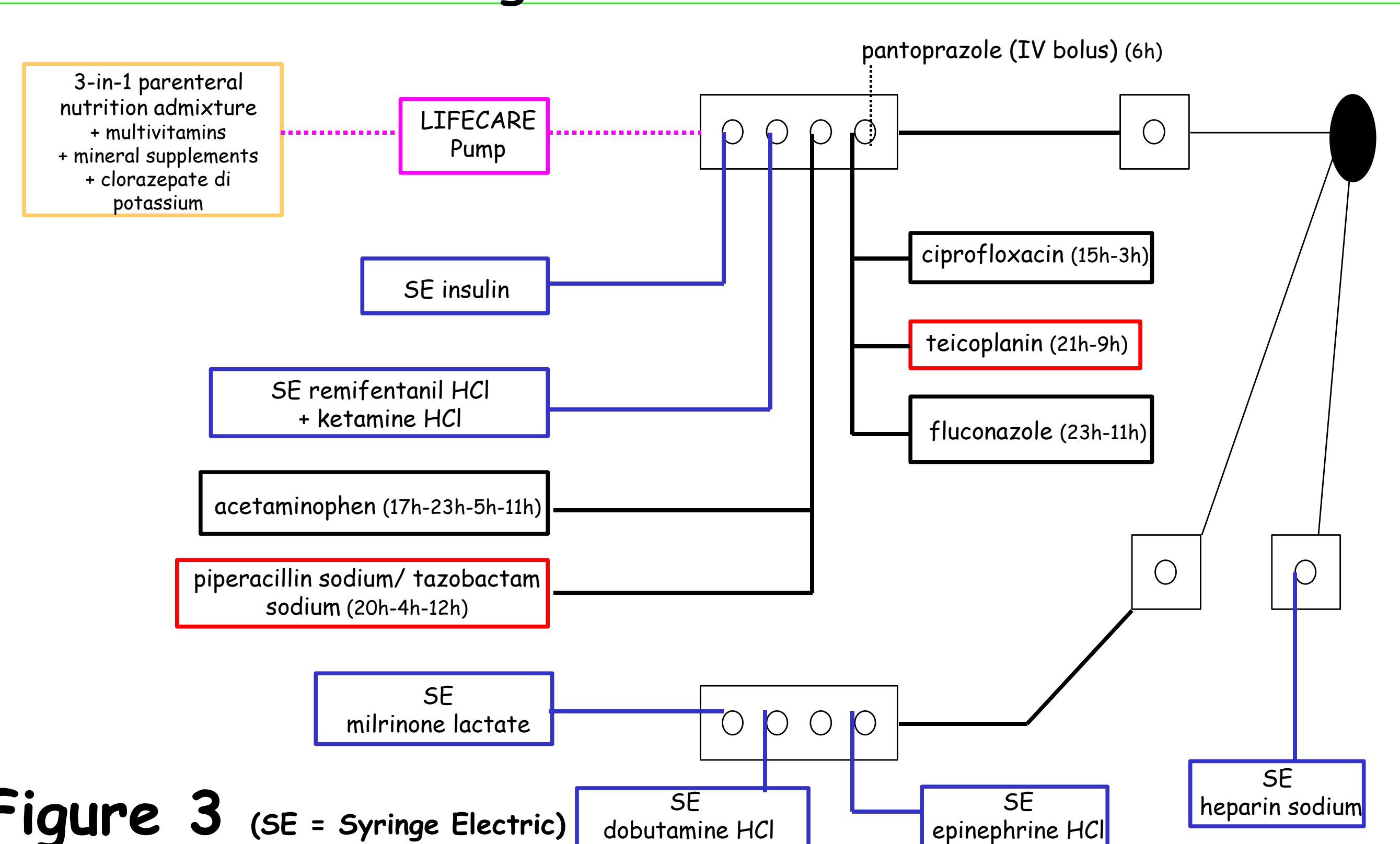


Figure 3 (SE = Syringe Electric)

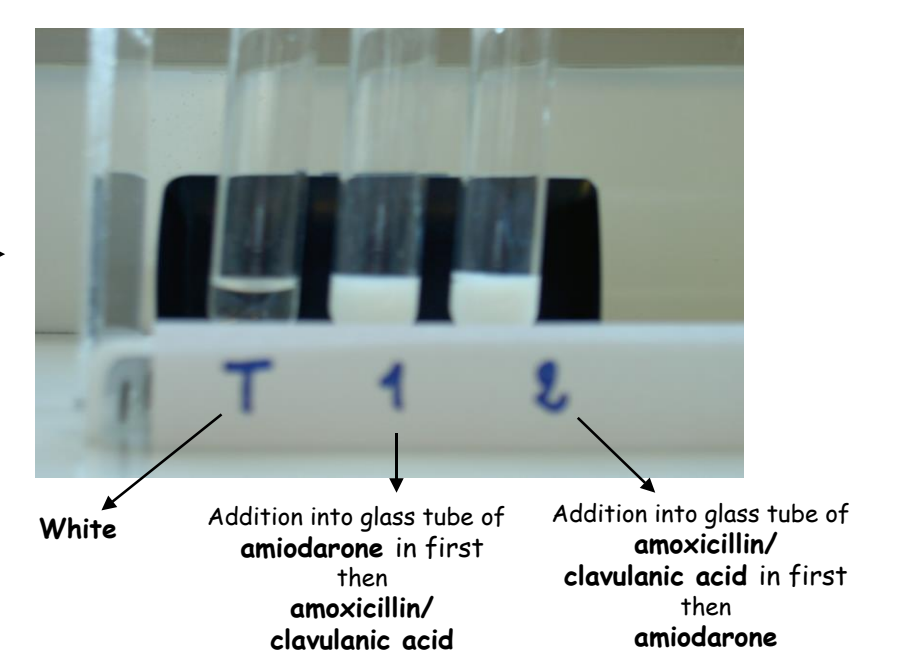
On the figure 3, we observed **34** different drugs mixtures:
- **6** physically compatible
- **28** without any data in the literature

The two important observations on this drawing are :
◆ In general, because of the absence of drug compatibility information with 3-in-1 parenteral nutrition admixtures, no drug (as clorazepate di potassium) should be administered simultaneously with parenteral nutrition admixture via a Y injection site.

◆ There is no data in the literature about the ketamine and remifentanyl admixture in the same syringe. (Poster ...27)

In regard to lack of data in the stability and compatibility literature, we tested 71 admixtures in our laboratory. We discovered **7 physical incompatibilities**.

Drug n°1	Drug n°2	Physically Incompatibilities observed
tramadol	rifampicin	heavy red-orange turbidity forms initially, becoming red-orange liquid with red precipitate
amiodarone	amoxicillin + clavulanic acid	immediate lactescence
bumetanide	ofloxacin	film on the surface in 15 hours
pantoprazole	aspirin	yellow color immediately
pantoprazole	midazolam HCl	yellow color immediately
pantoprazole	cyamemazine	immediate opalescence
pantoprazole	vancomycin HCl	slight color change in 10 hours



CONCLUSION

This study shows that it is very important to make nurses and physicians aware of compatibility problems. During meetings in the intensive care unit, we demonstrated incompatibilities by injecting the two solutions of each mixture into glass tubes. Proposals were also generated for avoiding potential incompatibilities in daily practice.

REFERENCES

1. TRISSEL LA. Handbook on injectable drugs. 12th ed. Bethesda, Md : American Society of Health-System Pharmacists, 2003 ; 1522 pages
2. VIGNERON J, GINDRE I, DEMORE B and coll. STABILIS 2 : Stabilité et compatibilité des médicaments injectables. CD-Rom, 2003