

Peripheral cell collection after mobilization with plerixafor in children: don't wait the sixth hour!

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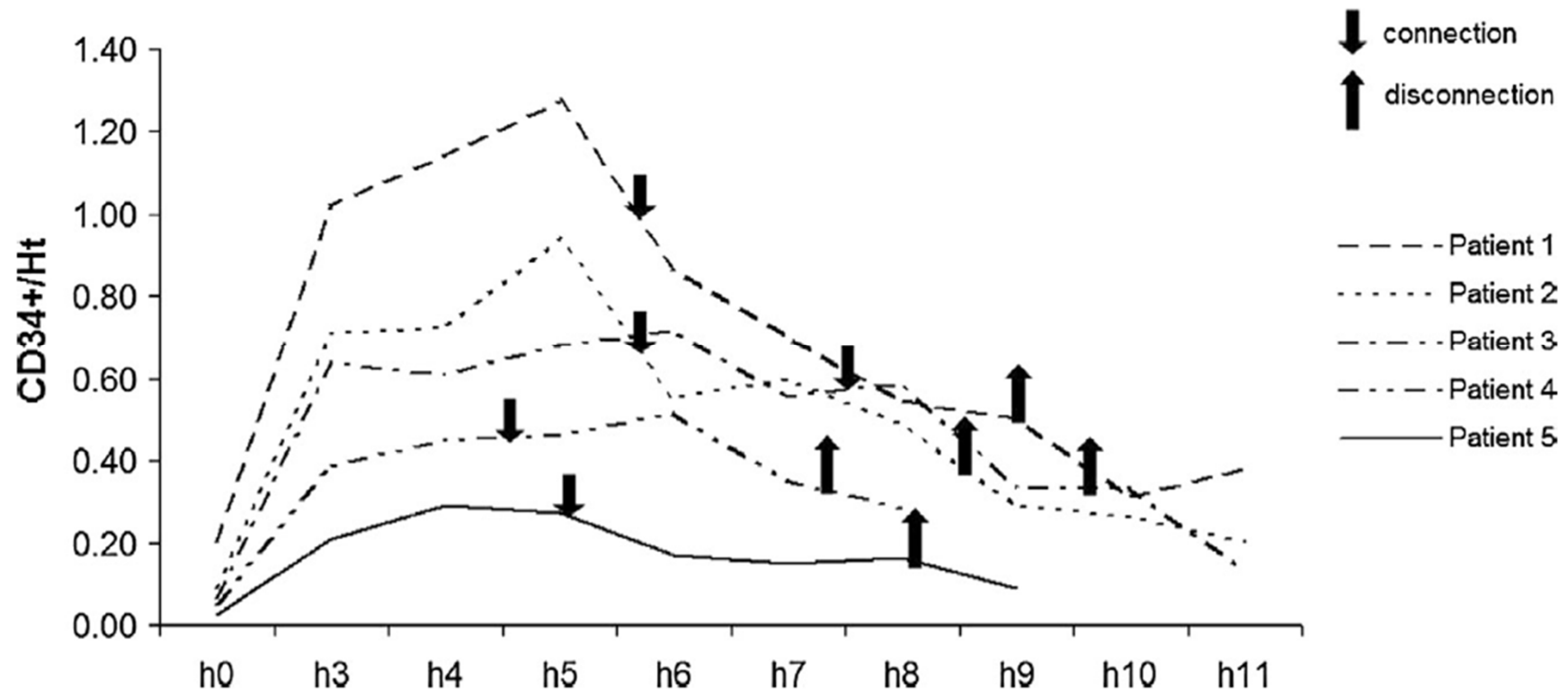
Introduction

Plerixafor

- **CXCR4 antagonist – acts by disrupting anchorage of stem cells in BM**
- **Recommended to be administered from 6 to 11 hours before apheresis**
- **In children: one author 10 to 14 hours**

Not much publications including pediatric population

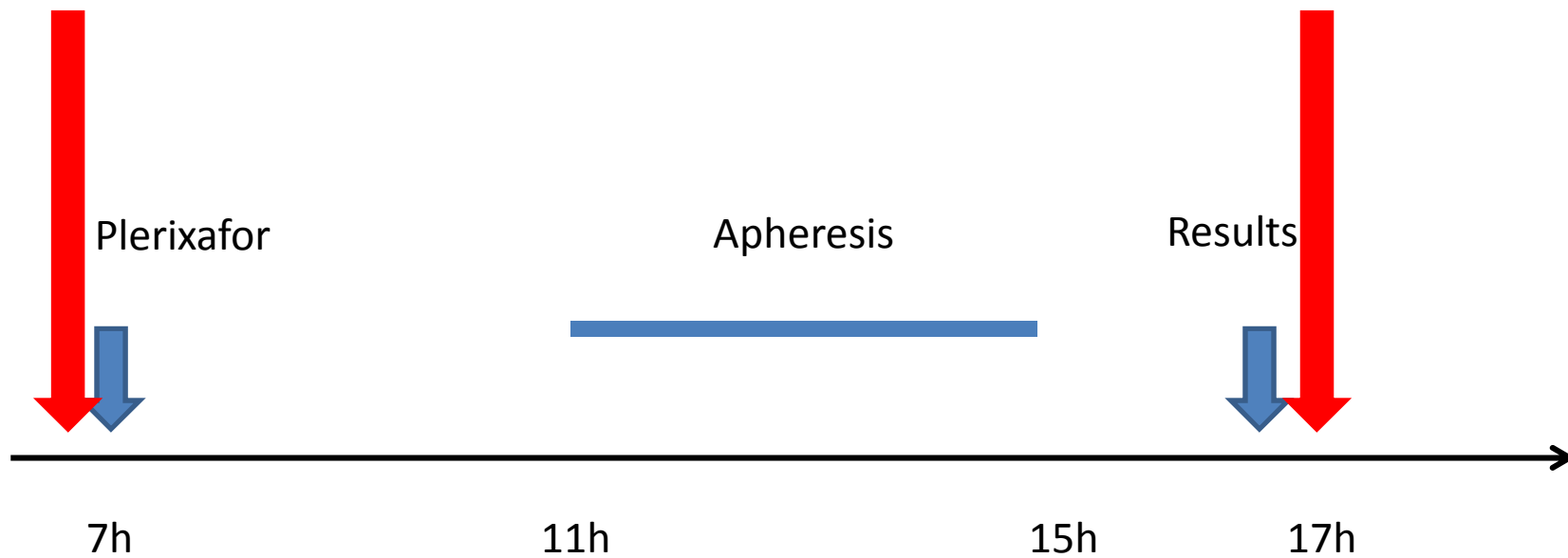
Kinetics of mobilization induced by Plerixafor alone in children



Introduction

Outpatient unit opening

Lab closure



Introduction

Question : is it efficient to start the apheresis before h4, when patient received plerixafor + G-CSF, in pediatric population ?

Patients and Methods

- **Restrospective study (2010-2015) - Pediatric apheresis in University Hospital of Clermont Ferrand, France**
- **Children with cancer. Mobilization with G-CSF in hematological steady state, bad–mobilizers on day 4**
- **Plerixafor at 7 am on day 5**
- **CD34⁺ cells blood count:**
 - at the plerixafor injection
 - at the beginning of apheresis
 - at the end of apheresis

Results - patients

Patient nb	Gender	Age	Weight (kg)	Diagnosis	Nb of apheresis
1	F	22 m	11	Neuroblastoma	1
2	M	13 y	30	Hepatoblastoma	1
3	F	4.5 y	17.5	Neuroblastoma	2
4	M	18 y	46	Hodgkin Disease	4
5	F	2 y	13	Neuroblastoma	2
6	F	16 y	39	Osteosarcoma	1
7	M	14 y	56	Ewing Sarcoma	1

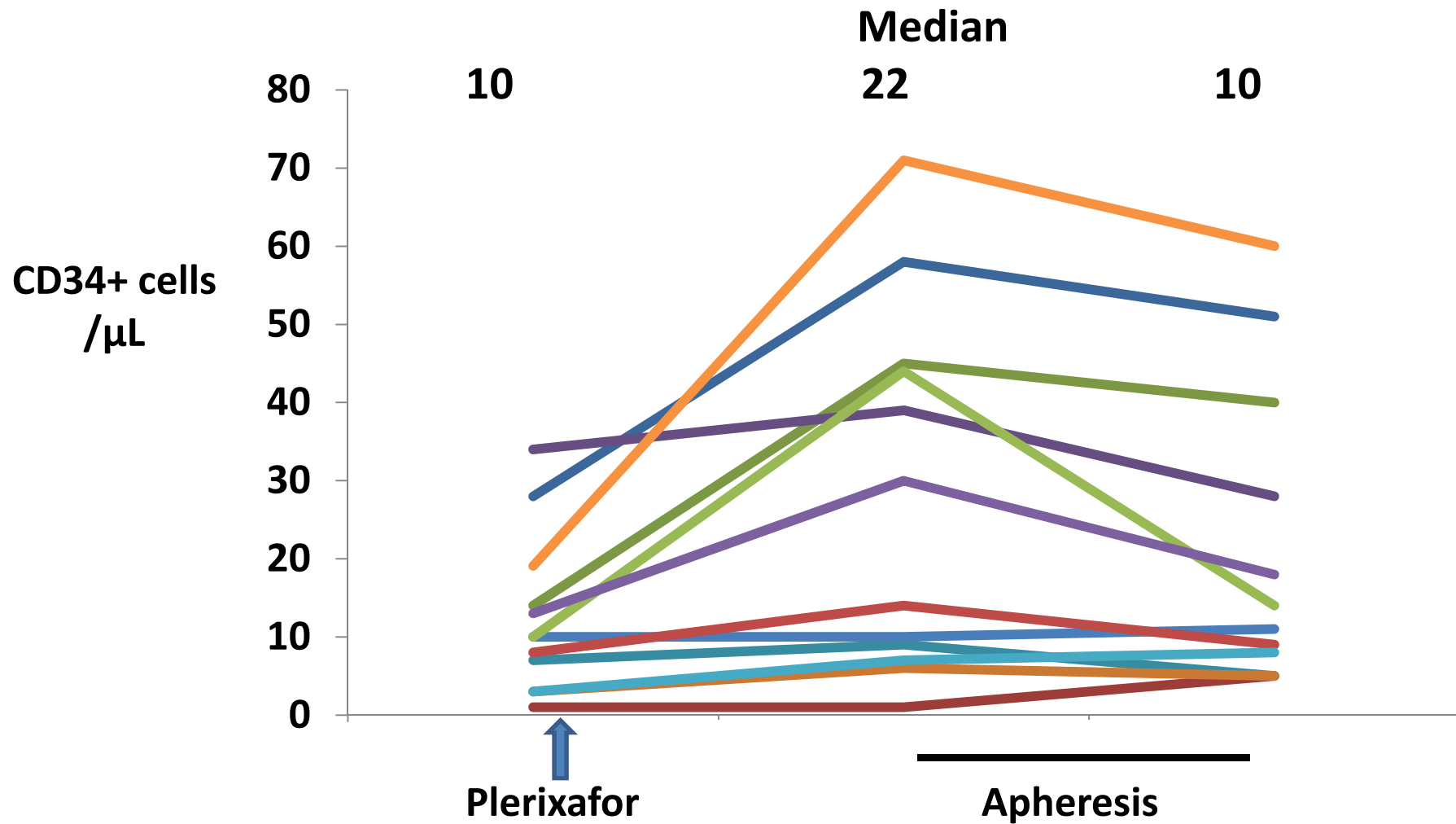
Results

Delay between plerixafor and apheresis: 4 hours [2:40 - 5:15]

Apheresis duration: 216 min [145 - 276]

Blood volume processed: 206 mL/kg [46 - 298]

Results - CD34⁺ blood count



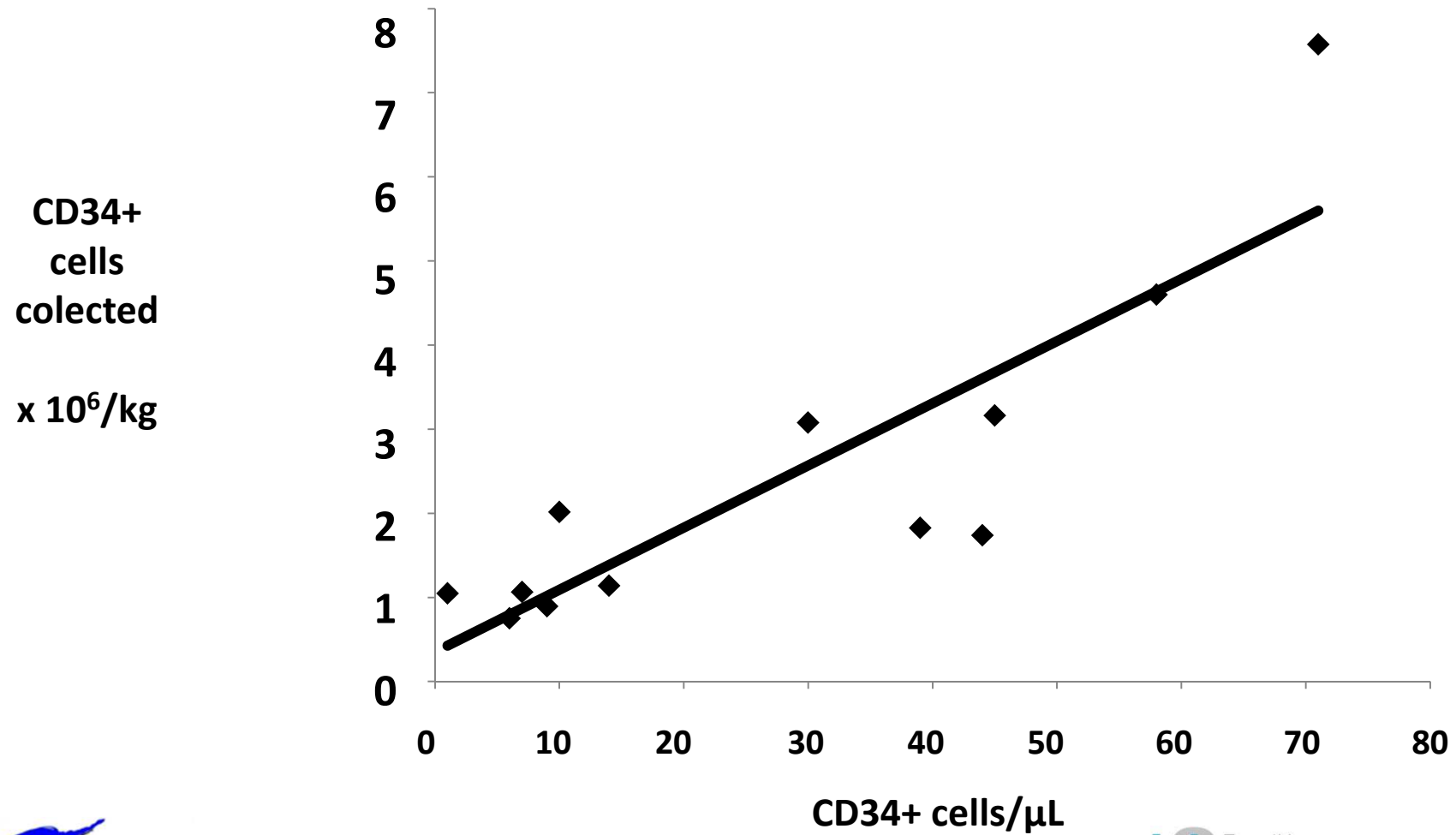
Results - collection

Pt nb	Age	Weight (kg)	Diagnosis	CD34 at day 4 (/μL)	Nb of apheresis	Overall collection (x10e6 CD34/kg)
1	22 m	11	Neuroblastoma	28	1	4.6
2	13 y	30	Hepatoblastoma	1	1	1.05
3	4.5 y	17.5	Neuroblastoma	14	2	5.1
4	18 y	46	Hodgkin Disease	7	4	4.7
5	2 y	13	Neuroblastoma	10	2	4.8
6	16 y	39	Osteosarcoma	3	1	1.06
7	14 y	56	Ewing Sarcoma	19	1	7.5

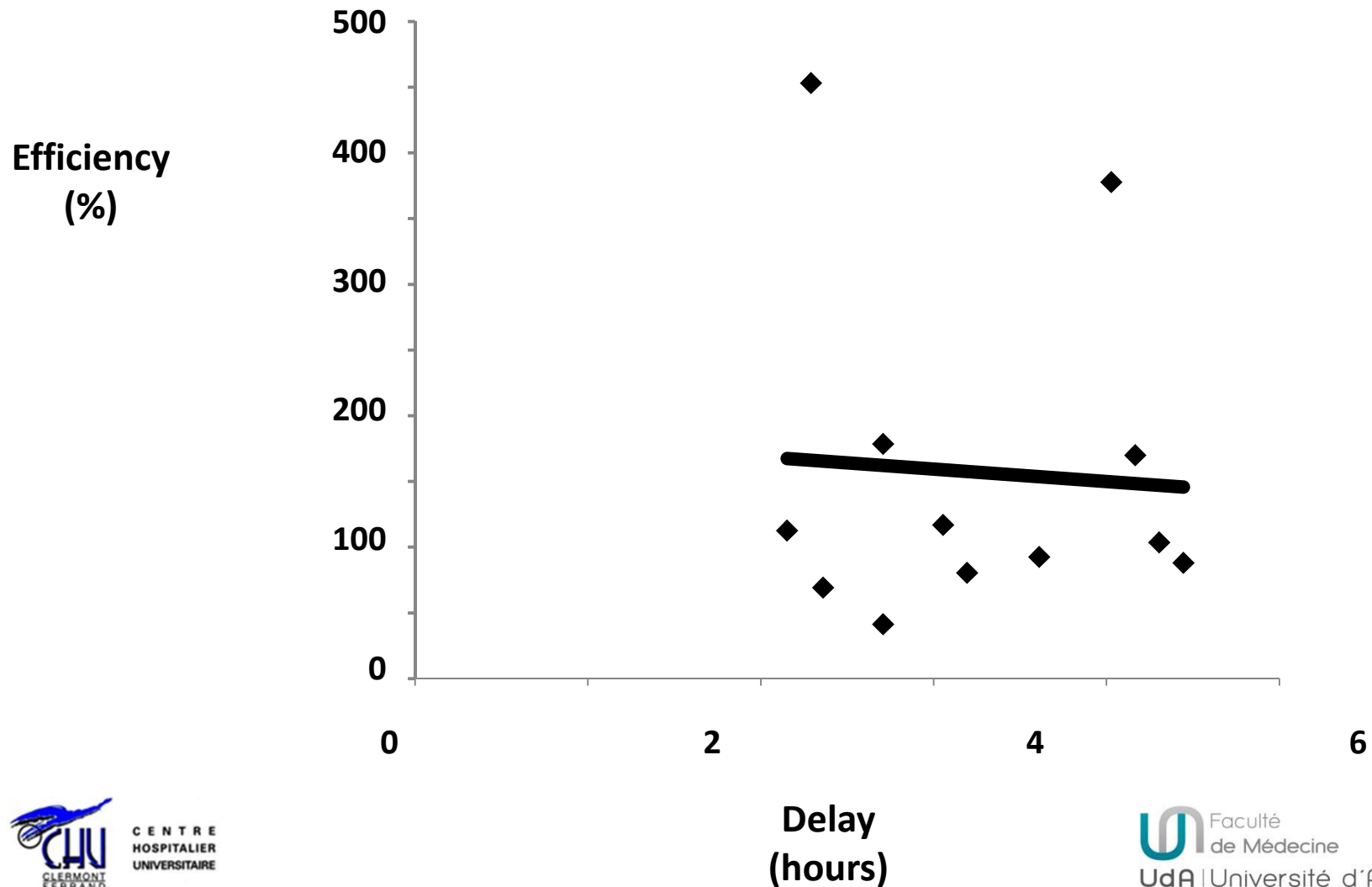
Results - Collection efficiency

- **Considering morning CD34+ blood count :
157% [41% - 453%]**
- **Considering start of apheresis CD34+ blood
count : 100% [20% - 378%]**

Results - Cell harvest depending on the blood count at the beginning of apheresis



Results – Collection efficiency depending on the interval plerixafor - apheresis



Discussion

- **No data about:**
 - pharmacokinetics of plerixafor in children
 - kinetics of mobilization induced by plerixafor in children
- **Our study suggests that mobilization peak occurs early after plerixafor injection**
- **but**
 - **CD34 blood content after apheresis should be impacted by:**
 - Hemodilution induced by apheresis
 - CD34 harvest
 - **We did not follow the CD34 blood count after apheresis**

Conclusion

- **Apheresis start 2 to 4 hours after plerixafor is feasible and efficient in children**
- **Allows better apheresis organization**
- **Mobilization plateau seems to be reached as soon as 3 hours after plerixafor in children**
- **Questions remain:**
 - 1. What is the kinetics of plerixafor-induced mobilization in children without apheresis ?**
 - 2. Is the kinetics of mobilization dose-dependent?**
 - 3. What is the optimal dose of plerixafor in children ?**