

CENTRAL VENOUS CATHETERS IN PEDIATRIC ONCOLOGY: SINGLE CENTRE EXPERIENCE

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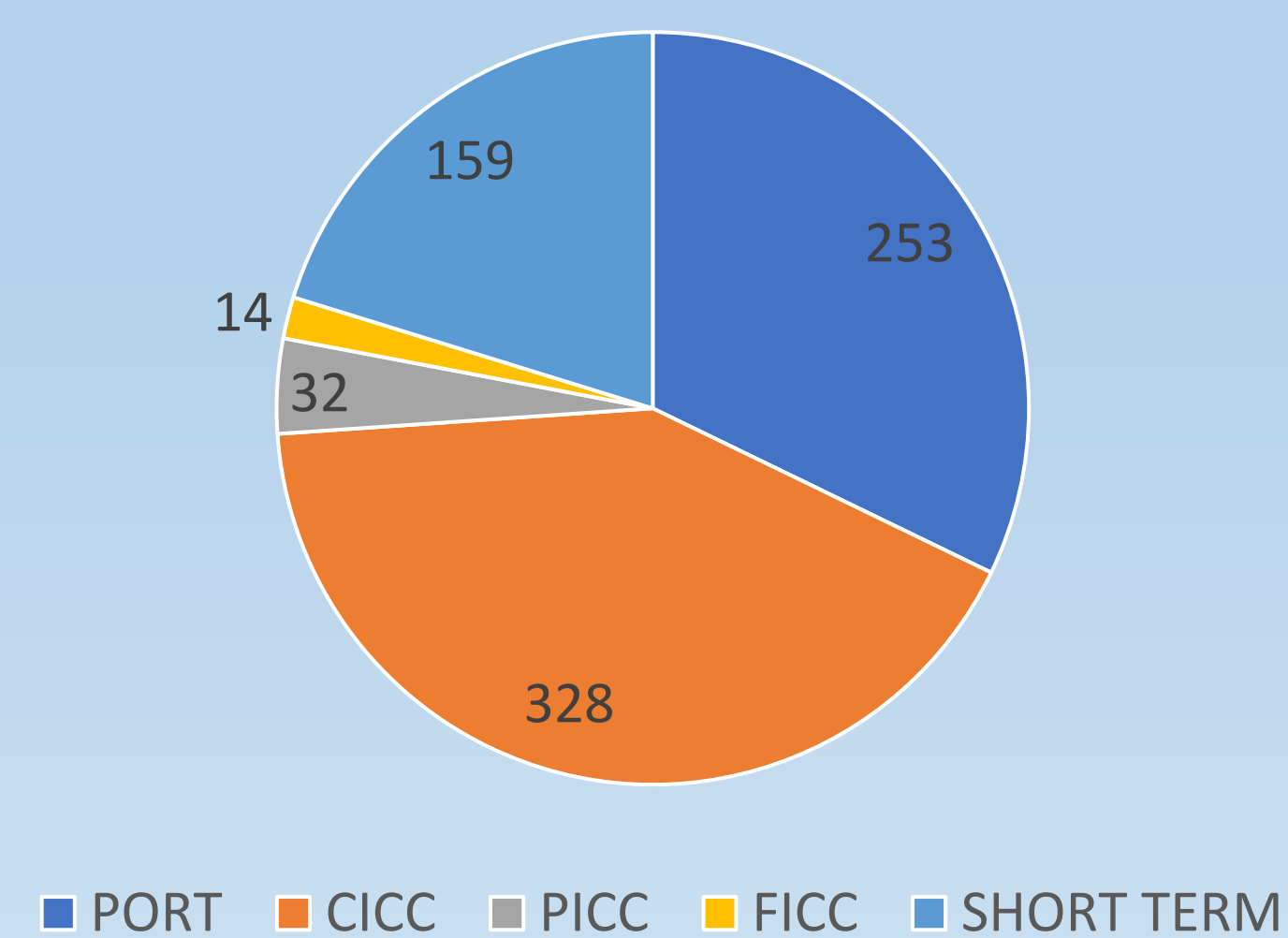
BACKGROUND

Most of pediatric oncology patients require very intensive treatment of their malignancy and complication of cancer treatment as well. We use intensive chemotherapy treatment regimens which are followed by complications as infection, bleeding, thrombosis, pain and many others. Central venous catheters are used for chemotherapy intravenous application and supportive care as fluids, analgetics, blood derivatives, vasopressors and of course blood samples taking as well. For different reasons we use different types of CVCs for different cohort of patients

CATHETER SELECTION

When choosing catheter type we customise. We consider wishes of the patient and the family of course. But most important is utility for the patient. Will he require intensive supportive care including febrile neutropenia treatment with all that entails? Will be heading for peripheral blood stem cell transplantation? Will he need full parenteral nutrition, may be vasopressor administration? Will be the catheter sustainable in long time? Are there any complications connected with different types of catheters in different localisations like thrombotic or infectious complications? These are the main questions we discuss.

CATHETER TYPE, 5-YEAR PERIOD: JANUARY 2018
- MARCH 2023(TOTAL 786 CVC)



FIRST CHOICE: CICC

In those patients requiring intensive supportive care including febrile neutropenia treatment, we use exclusively 5 Fr double lumen power injectable catheters. This is also given by fact that we don't have multidisciplinary intensive care unit and we are used to administrate vasopressors as well so double lumen catheter is very handy. They have very little risk of thrombotic complications.

SECOND CHOICE: PORT

Venous port implantation is more invasive intervention but children can benefit from it. We keep this solution for less intensive treatment expecting less complications to solve. Generally appropriate for smaller children with Wilms tumor, neuroblastoma, hepatoblastoma and brain tumors with low or intermediate risk treatment. And of course paliative care for the whole spectrum of age. They have also very little risk of thrombotic complications.

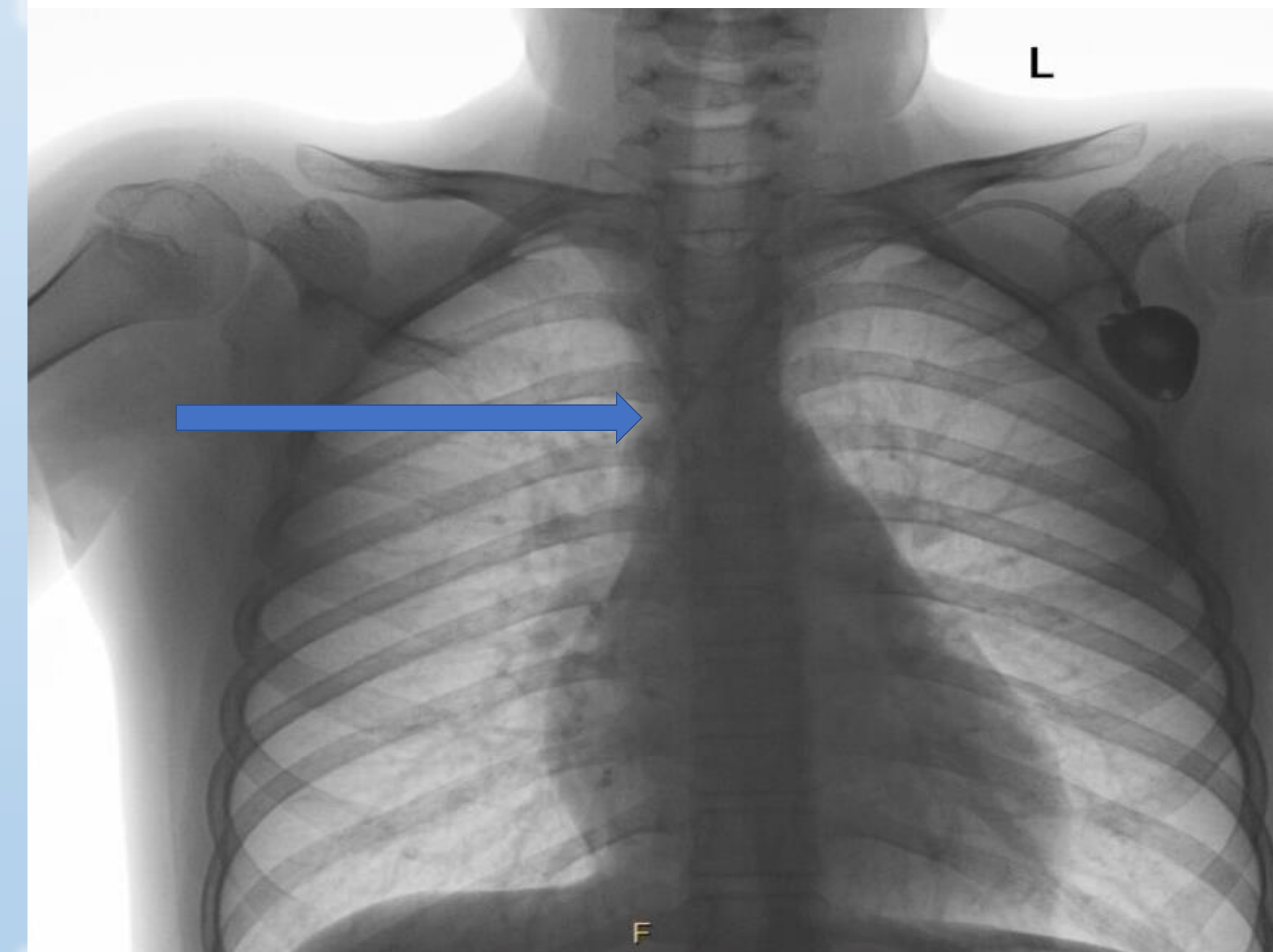
PICC: DOES IT WOTH IT?

We recorded very high rate of PICC related thrombosis despite all efforts to follow the best clinical practice and all the bundles. From 32 inserted PICCs we had 7 cases of CVCrT (22%), however all of these cases occurred in 5 FR double lumen catheters (total catheter inserted n=19), 4 Fr single lumen (total catheter inserted n=13) did't recorded any thrombosis although the spectre of diagnosis and patient was similar. There was significant difference between these two groups (5 Fr vs 4 Fr). We explain it by possible vessel caliber reduction after stopping hyperhydration and discharge patient from hospital following by lower oral fluid intake. Caliber of the vein was usually measured during hyperhydration in the hospital so we assume the baseline caliber could be overrated, however this will require more investigation

FICC: LONG TERM SOUSTAINABLE CATHETER IN OUTPATIENT TREATMENT

Despite of high risk thrombotic rate we consider this catheter as long term possibility (higher months) for those that can't have acces to vena cava superior, typically mediastinal lymphomas, soft tissue sarcomas and germ cell tumors. But we recorded higher rate of malfunctions.

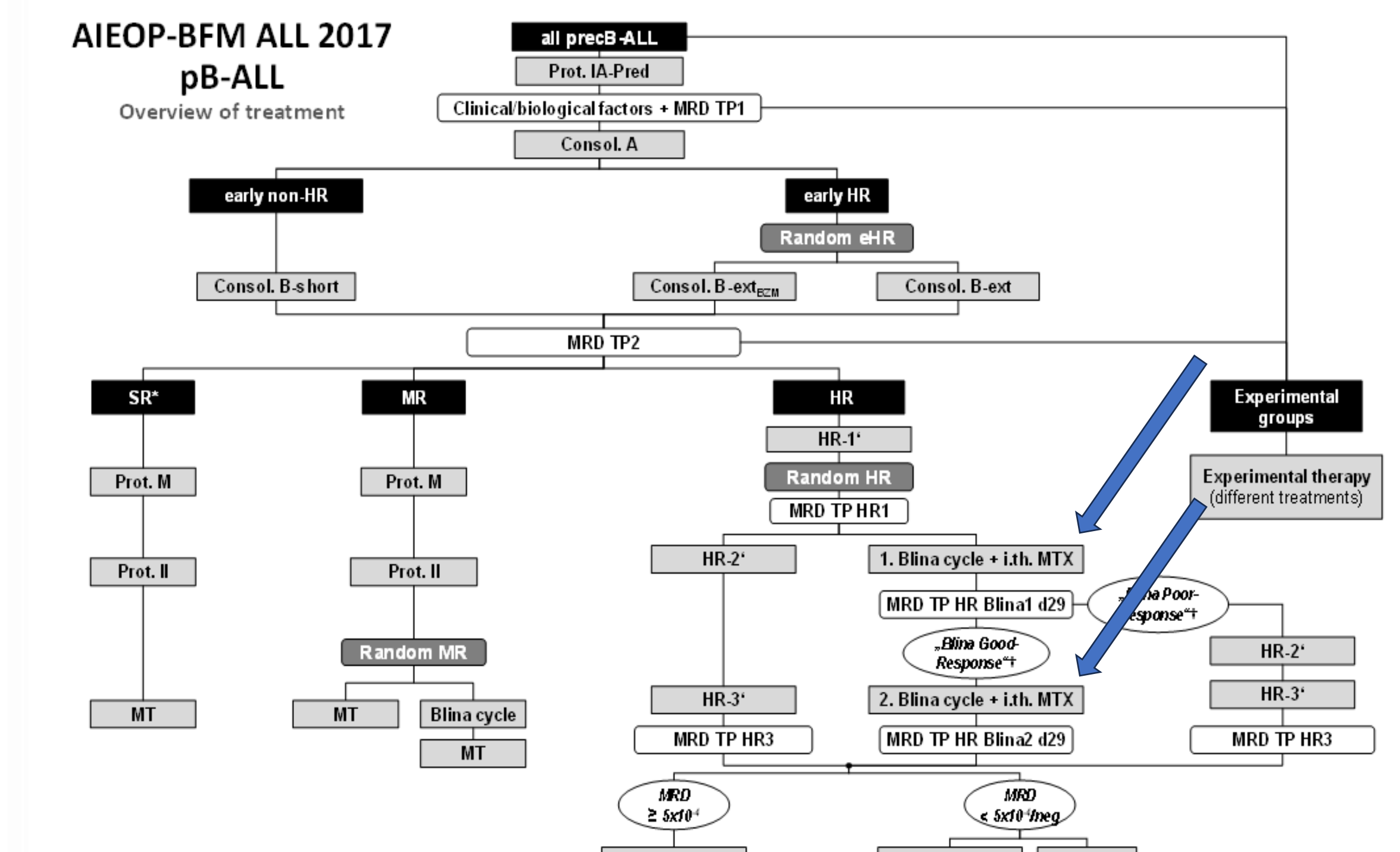
WHY RIGHT-SIDED SUPRACLAVICULAR APPROACH?



Because patients are growing and they could have CICC and ports for years. This relative catheter shortening causes catheter malfunctions - the tip presses on the vessel wall. Second - from right sided supraclavicular puncture the guide-wire goes directly to the right atrium. We recorded about 2% of primary guide-wire malpositions during the cannulation.

ALL: FROM PORT TO CICC

This is the main reason why we switch from port to CICC in acute lymphoblastic leukemia treatment: blinatumomab continuous 28-day infusion that require special lumen for administration



CONCLUSIONS

We consider suitable type of catheter to every patient. 5 Fr double lumen high pressure catheter is the method of choice for those who require intensive care treatment. Preferably by right supraclavicular approach. FICC is the best choice for those with mediastinal mass or supraclavicular lymphadenopathy. However this type of access is sustainable in long term, together with PICC 5 Fr catheter they are the most burdened with risk of deep vein thrombosis, so early replacement for CICC could be also the solution. There is a subgroup of PICC patients with 4 FR single lumen catheters which we did not recorded any CVCrT.