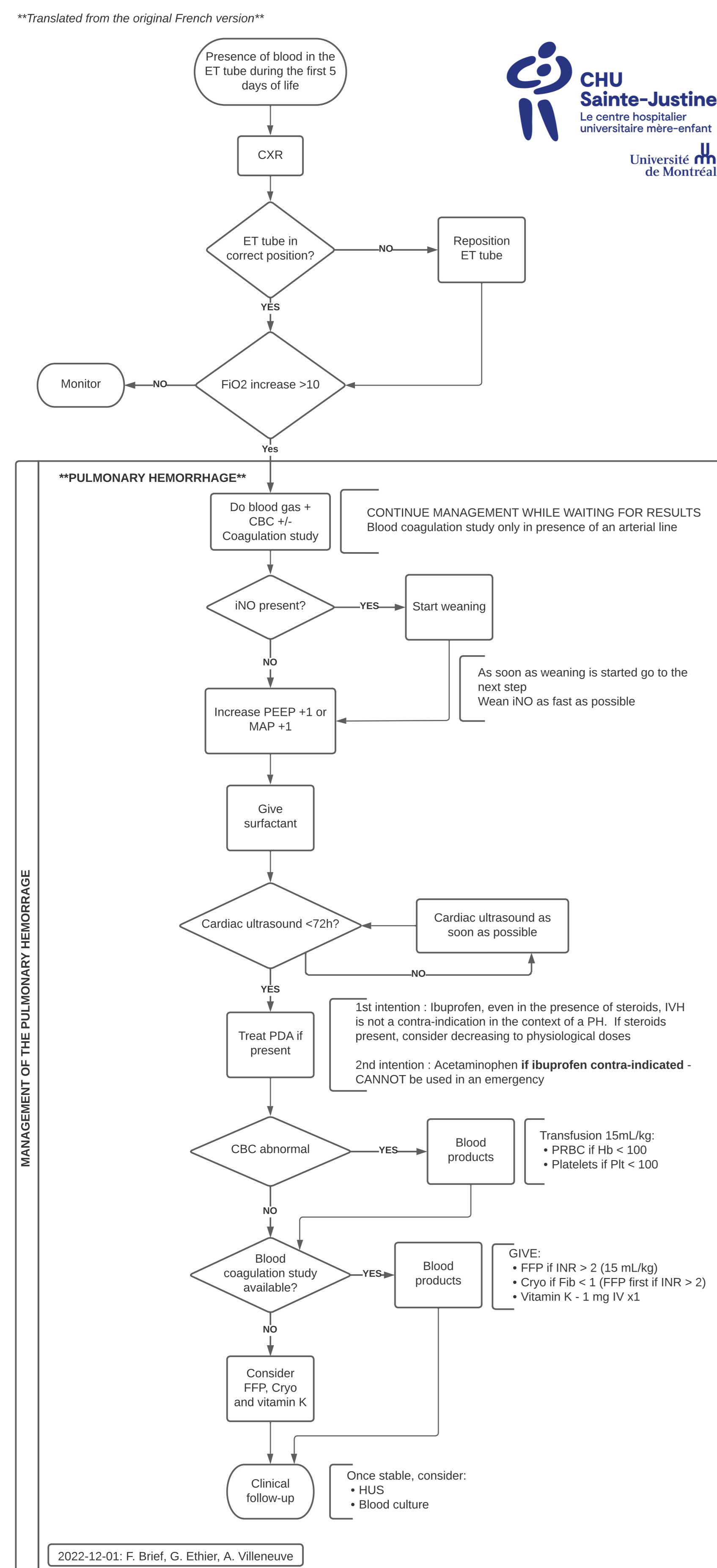


## AIM: Standardize management of pulmonary hemorrhage in preterm neonates in the NICU of CHU Sainte-Justine

### Context

- Prevalence of pulmonary hemorrhage (PH) ; 50/1000 neonates (Local PH prevalence (2016-2022 ~8.8% <29 weeks GA)
- Risk factors : prematurity, IUGR, PDA
- Peak at DOL 3
- High mortality (50%)
- No consensus for the optimal management --> high variability of practices

### Algorithm



### Measures/PDSA cycle

PDSA #1	PDSA #2	PDSA #3
<ul style="list-style-type: none"> <li>• Literature review</li> <li>• Chart review (Epoch 1)</li> <li>• Algorithm development</li> <li>• CME discussion of management Implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Follow up of implementation</li> <li>• Reminder about the existence of the algorithm</li> <li>• Chart review</li> <li>• EPIQ presentation followed by NICU presentation</li> <li>• Easy access to the algorithm</li> </ul>	<ul style="list-style-type: none"> <li>• Future</li> <li>• Adaptation of the algorithm</li> <li>• Continuous improvement</li> </ul>

#### MEASURES:

##### Process measures:

- Steps of the algorithm respected (CXR, Blood work, surfactant, MAP increase)

##### Outcome measure

- Exposure to blood products according to suggested thresholds
- IVH post PH
- Mortality 2<sup>nd</sup> to PH

#### EPOCHS:

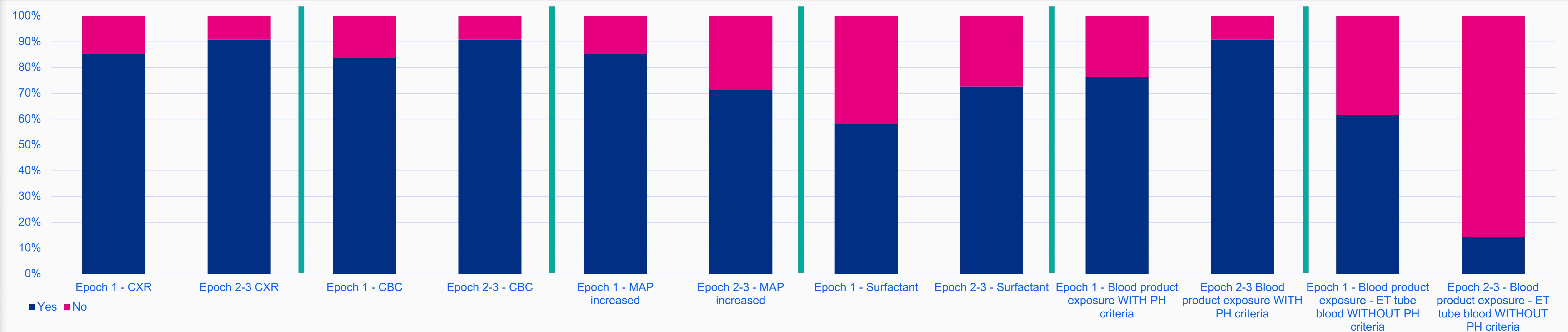
**Epoch 1:** Pre-presentation of the algorithm (82 patients with ET tube blood – 2016-2021)

- 15 excluded (Congenital anomalies, Not a PH or HIE)

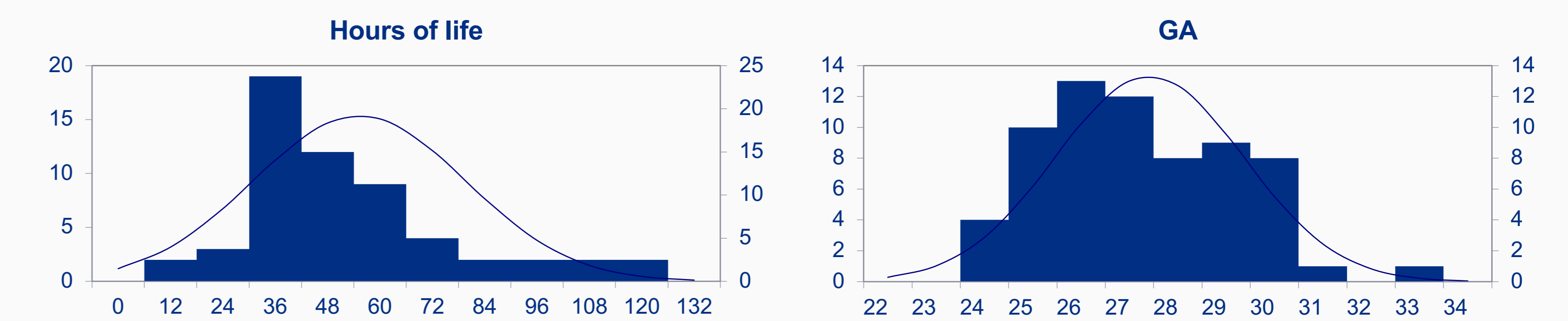
**Epoch 2:** Contamination period – Period between the presentation of the algorithm and the unit implementation (8 patients with ET tube blood – 2022)

**Epoch 3:** Post implementation (15 patients with ET tube blood – 2023)  
5 excluded (Congenital anomalies, HIE, Heparin)

### Results



- When a CXR was done, the ET tube was too deep 4/10 times
- Blood culture post PH was positive (1/3 when PH >72h of life - 1/2 when PH >96h of life)
- No increase in IVH even with less use of blood products
- No platelets were given outside threshold suggested
- When coagulation study available 2/3 times did not reach threshold
- When CBC available, 2/3 times, PRBC and platelets not mandated



### Conclusions and next steps

#### Adjust algorithm:

- Sepsis more likely in late presentation (>96h of life) – Way to improve algorithm and decrease blood work
- Importance of confirming CBC & Coagulation study (if possible) to avoid unnecessary blood product exposure
- Improve use of surfactant and MAP increase as part of PH management

#### Monitor ventilation practices:

- Encourage gentle ventilation practice (wean in presence of lower pCO<sub>2</sub>)
- In the context of ETT bleed, CXR should be prioritized