Exercise 5: Tear Tube (Fluid dynamics)

- Model wizard/3D Model/Fluid Flow/Single Phase Flow/Laminar Flow/Stationary
- Geometry/Set length unit to mm
- Geometry/Cylinder/Set radius = 0.8 mm and height = 16 mm
- Geometry/Cylinder/Set radius = 0.4 mm and height = 1 mm, Position z = 4 mm, Axis type = x
- Geometry/Cylinder/Set radius = 0.4 mm and height = 1 mm, Position z = 8 mm, Axis type = x
- Geometry/Cylinder/Set radius = 0.4 mm and height = 1 mm, Position z = 12 mm, Axis type = x
- Geometry/Booleans and Partitions/Union/ Select the 4 cylinders, unckeck Keep interior boundaries
- Geometry/Block/ Width=10mm, Depth=10 mm, Height=20 mm, Position/Corner x=-5mm, y=0mm, z=-2mm
- Geometry/Booleans and Partitions/Difference/ Add cylinder, Substract block
- Material/Add material/Built-in/Water (liquid)
- Laminar Flow/Inlet/Fully developed flow/Flow rate= 0.5*1.5 [ml/day] (half geometry)
- Laminar Flow/ Fully developed flow/Average pressure Pav=1 [atm]
- Laminar flow/Symmetry : select the cut surface
- Results/Derived values/Integration/Surface Integration: expression: 2*spf.U (2*velocity) [ml/day] (twice to get the entire device), selection : all outlets
    - Since outlet flow should be perpendicular to outlet surface we might use spf.U, but in principle we should use v (the perpendicular component of the flow velocity)
- Results/Derived values/Average/Surface average :expression: p-1 [atm], selection: inlet surface
- To have a more homogeneous delivery, you might adapt the size of the outlet holes.