

# *Patient doses in a biplane angiography system*

*C. Andrés, M. Agulla, R. Torres, H. Perez-García,  
A. del Castillo, D. Miguel, J. de Frutos, D. Alonso,  
C. Pérez, M. Gómez*

*Servicio de Radiofísica  
y Protección Radiológica  
Hospital Clínico Universitario  
Valladolid (Spain)*



# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## ***INTRODUCTION***

- ***Biplane angiography systems:***
  - ***Huge advance in neurointerventional procedures***
  - ***Possible increase in patient doses***

## ***PURPOSE***

***Evaluate patient doses in a biplane angiograph***

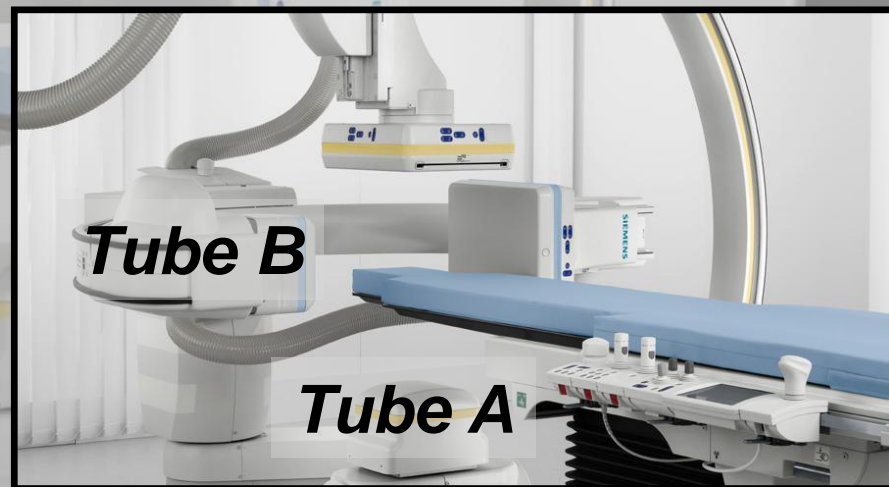


# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## ***METHODS***

- ***Siemens Artis Zee Biplane***
- ***One year study (358 interventions)***
- ***Analysis of Radiation Dose Structured Reports***
- ***Parameters:***
  - ***Radiation time***
  - ***Skin dose***
  - ***Dose at interventional reference point***
  - ***Dose-Area Product (DAP)***



# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## ***RESULTS: RADIATION TIME***

- ***Total average radiation time:  
39:03 ± 4:05 minutes***
- ***Tube A average radiation time:  
27:48 ± 3:14 minutes***
- ***Tube B average radiation time:  
11:15 ± 2:30 minutes***
- ***Maximum radiation time registered:  
7:12:34 hours***

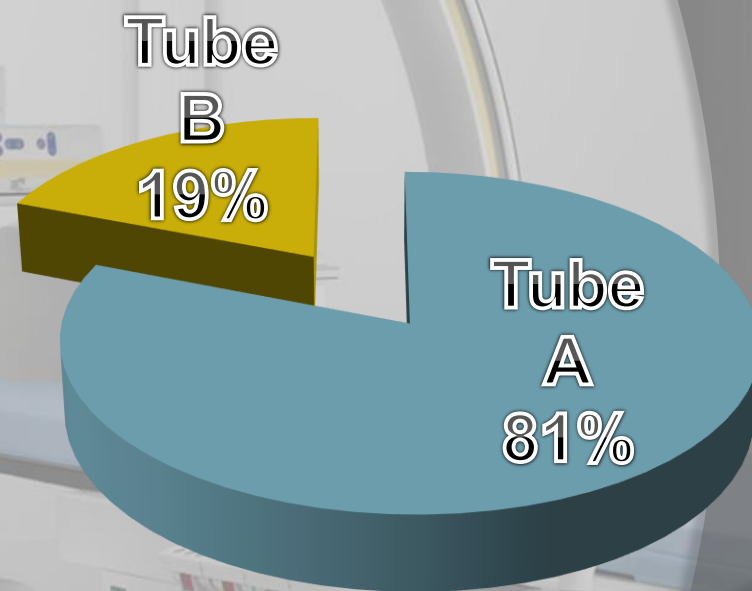


# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## RESULTS: DOSE-AREA PRODUCT

- **Total average DAP:**  
 **$136 \pm 11 \text{ Gy cm}^2$**
- **Tube A average DAP:**  
 **$110 \pm 11 \text{ Gy cm}^2$**
- **Tube B average DAP:**  
 **$26 \pm 4 \text{ Gy cm}^2$**
- **Maximum DAP registered:**  
 **$1435 \text{ Gy cm}^2$**

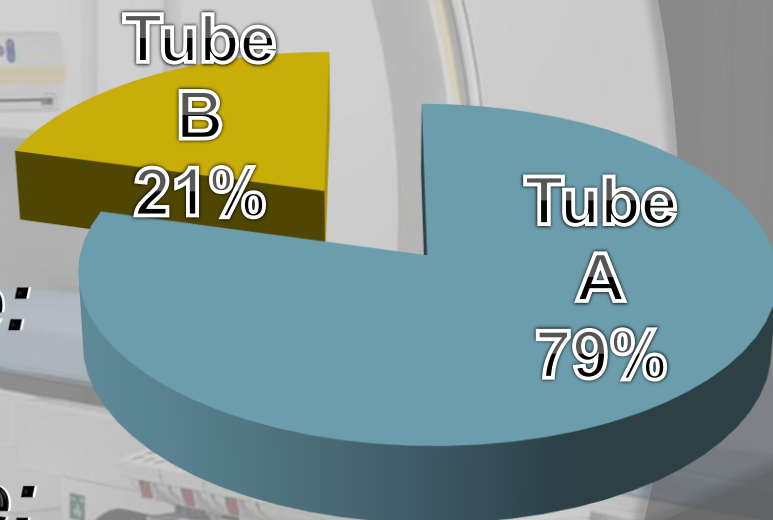


# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## ***RESULTS: INTERVENTIONAL REFERENCE POINT DOSES***

- ***Total average RP dose:***  
***1.45 ± 0.21 Gy***
- ***Tube A average RP dose:***  
***1.15 ± 0.15 Gy***
- ***Tube B average RP dose:***  
***0.30 ± 0.07 Gy***
- ***Maximum RP dose registered:***  
***17.11 Gy***



# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## ***RESULTS: MAXIMUM SKIN DOSE***

- ***Average for tube A:***  
 ***$0.55 \pm 0.07$  Gy***
- ***Average for tube B:***  
 ***$0.51 \pm 0.09$  Gy***
  
- ***Maximum for tube A:***  
***4.24 Gy***
- ***Maximum for tube B:***  
***4.20 Gy***



# PATIENT DOSES IN A BIPLANE ANGIOGRAPHY SYSTEM

C.Andrés, M.Agulla, R.Torres, H.Pérez-García, A.del Castillo, D.Miguel, J.de Frutos, D.Alonso, C.Pérez, M.Gómez  
Hospital Clínico Universitario Valladolid (Spain)

## CONCLUSIONS

- *Patient doses are evaluated.*
- *Doses significantly greater than other interventional procedures.*
- *Radiation time and DAP higher for tube A (usually craniocaudal).*
- *Maximum skin entrance dose similar in both planes.*