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The ESO Stroke Summer School was supported by:



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1. Introduction

In October 2021, it was a great pleasure to host the 24th ESO Stroke Summer School. Despite two attempts to organise a face-to-face meeting, with hands-on trainings on stroke models, the summer school had to take place as a virtual event. The LOC supervised the programme and Open Audience was in charge of all technical aspects, including recorded sessions by videoconference. Even with the time lag and distance, speakers and participants managed to keep the summer school lively and interactive. We highly appreciated the commitment of the 26 early-career participants. They did an incredible job, in a short period, to give their opinion on four current controversies in stroke management in front of a faculty of experienced international peers. This was the occasion to award the best controversy prize, which was dedicated to Christine Krarup Hansen, our young colleague from Copenhagen, who sadly passed away early October 2021. Congratulations to the winning group: Ahmad Nehme, Amina Sellimi, Alejandro Fuerte Hortigon, Enrico Colangeli, Lénia Silva, Nicola Rifino and Vignan Yogendrakumar

During the summer school, renowned experts from various fields of stroke presented fantastic studies on various aspects of cerebrovascular diseases.

We would like to take the opportunity to express our sincere gratitude to all contributors, in particular ESO, the speakers, Open Audience, Patricia Leconte, and most of all, the participants. Together, despite the frustration of not being together, you made it possible.

Local Organising Committee

Emmanuel Touzé



Dean of the Health School at Caen Normandy University

Head of the Neurovascular Unit at Caen University Hospital

LOC Chair



Marion Boulanger



Neurologist at the Neurovascular Unit at Caen University Hospital

Carine Ali



Professor of Neuroscience at Caen Normandy University

2. Organisation timeline

Applicants applied online via a dedicated website (<https://esofrance.wixsite.com/monsie-1>) before the deadline for application, which was extended to 30 September.

Ten days before the summer school, attendees were randomly allocated to one of four groups, each being in charge of preparing a presentation of a specific current controversy in stroke.

After the summer school, participants received a certificate of attendance.



3. Scientific and social programmes

DAY 1 - Morning – Thursday, 21 October 2021

9:00 am- Welcome (Emmanuel Touzé, on behalf of the LOC) 15'

9:20 am- New perspectives in endovascular treatment (Emmanuel Touzé / Marion Boulanger)

1. Automated core-penumbra quantification in acute ischemic stroke : principles and different tools
Joseph Benzakoun (Paris) 20'
(15' +5')
2. Controversy: Bridging therapy versus mechanical thrombectomy alone
Chair: Urs Fischer (Bern) / Yvo Roos (Amsterdam)
 - a. Presentation of the controversies by group 1 (students) 15'
 - b. Update on ongoing trials and unresolved issues and debate
Urs Fischer (Bern) / Yvo Roos (Amsterdam) 40'
(20' +20')
3. Interventional vascular medicine with robotic assistance (Robocath)
Philippe Bencteux (Rouen)/ Francois Eugène (Rennes) 15'
(10' +5')

10:50 am- Coffee break

11:10 am- Future developments in IV thrombolytic agents (Carine Ali / Denis Vivien)

1. When tenecteplase should be preferred over alteplase?
Jukka Putaala (Helsinki) 20'
(15' +5')
2. Molecular imaging of clots to predict therapeutic response
Maxime Gauberti (Caen) 20'
(15' +5')
3. How to improve the thrombolytic effect of alteplase and to reduce the risk of bleeding, alteplase mutants?
Denis Vivien (Caen) 20'
(15' +5')
4. New antithrombotic targets: antiGP6, antiGP1, von Willebrand
Sara Martinez de Lizarrondo (Caen) 20'
(15' +5')

Free Lunch



DAY 1 – Afternoon

1:30 pm - Prehospital management of acute ischemic stroke (*Emmanuel Touzé/Heinrich Audebert*)

1. Mobile Stroke unit: Effects on process indicators, outcomes and cost utility
Heinrich Audebert (Berlin) 20'
(15' +5')
2. Controversy: mother ship vs drip and ship
Chair: Emmanuel Touzé (Caen), Heinrich Audebert (Berlin) 15'
 - a. Presentation of the controversies by group 2 (*students*)
 - b. Utility of prehospital score to predict large artery disease
Guillaume Turc (Paris) 30'
(15' +15')
 - c. Place of geographic modelling of best transport option for treatment of acute ischemic stroke
Ludwig Schlemm (London) 20'
(15' +5')
 - d. Debate: Is there a need for randomized trials?
Natalia Pérez de la Ossa (Barcelona), Richard Macrez (Caen) 30'
(20' +10')

3:40 pm - Virtual social event

WW2: the Normandy invasion and D-Day beaches (*Claire Lesourd*)

DAY 2 - Morning – Friday, 22 October 2021

9:00 am- Genetics of stroke (*Carine Ali / Emmanuel Touzé*)

1. How to interpret SNP, GWAS (with examples in stroke diseases)
Stéphanie Debette (Bordeaux) 30'
(20' +10')
2. Key role of HTRA1 in cerebral SVD : showcasing the power of proteomics
Martin Dichgans (Munich) 30'
(20' +10')
3. Clinical genetics of moyamoya angiopathy
Dominique Hervé (Paris) 30'
(20' +10')

Coffee break

10:45 am- Small vessel diseases (*David Werring*)

1. Small vessel diseases: pathophysiology, classification, genetics
Eric Jouvent (Paris) 30'
(20' +10')



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|--|-----|
| 2. Animal models of small vessel diseases
<i>Anne Joutel (Paris)</i>
(20' +10') | 30' |
| 3. Cerebral vasculitis
<i>Marcel Arnold (Bern)</i>
(20' +10') | 30' |
| 4. Imaging of sporadic haemorrhagic cerebral microangiopathies
<i>Grégoire Boulouis (Tours)</i>
(20' +10') | 30' |

Free lunch

DAY 2 – Afternoon

1:30 pm - Heart and stroke (*Marion Boulanger/Valeria Caso*)

- | | |
|--|-----|
| 1. Controversy: Whether to resume or not antithrombotic therapies after intracerebral haemorrhage | |
| a. Presentation of the controversy by group 3 (students) | 15' |
| b. Update on ongoing trials and unresolved issues and debate | 20' |
| <i>Marion Boulanger (Caen)</i> | |
| c. Indications and complications of left appendage closure in stroke patients with atrial fibrillation | |
| <i>Valeria Caso (Perugia)</i> | 20' |
| | Q&A |
| 15' | |
| 2. Place of implantable cardiac monitors in cryptogenic stroke? | |
| <i>Mira Katan (Zurich)</i> | 20' |
| (15' +5') | |

Coffee break

3:15 pm - Neurosurgery in stroke (*Thomas Gaberel*)

- | | |
|---|-----|
| 1. Hemi-craniectomy for ischaemic and haemorrhagic stroke
<i>Bart van der Worp (Utrecht)</i>
(15' +5') | 20' |
| 2. Local thrombolytic therapies in intraventricular haemorrhage: rationale, update of recent and future trials
<i>Thomas Gaberel (Caen)</i>
(15' +5') | 20' |

4:00 pm - Virtual social event:

Caen & Mont St Michel: a discovery of two Norman gems (*Claire Lesourd*)



DAY 3 - Morning – Saturday, 23 October 2021

9:30 am- Virtual visit of Cyceron – stroke models

30'

Carine Ali (Caen)

10:00 am- Diagnosis, risk factors and prognosis (*Alastair Webb / Else Charlotte Sandset*)

1. BP target after stroke (ischemic vs. haemorrhagic, small vessel disease vs. others)
 - a. Presentation of the controversies by group 4 (students) 15'
 - b. Update and recommendations: Diagnosis, significance, and management of blood pressure variability in cerebrovascular diseases 40'
(20' +20')
Alastair Webb (Oxford)
2. Socio-economic disparities and stroke
Marion Boulanger (Caen) 30'
(20' +10')
3. Meditation in neurovascular and neurodegenerative disorders
Gael Chételat (Caen) 30'
(20' +10')

11:50 pm- Announcement of the laureates of the “Christine Krarup Hansen prize”.

Farewell



4. Feedback

Attendees filled in an online survey to evaluate both the content and the format of the summer school.

A grading system was used, and the results hereafter are the mean values of all grades. (1 =strongly disagree, 5 = fully agree)

Scientific sessions							
Would you deem the scientific sessions to be relevant for clinical practice and for research perspectives?							
1. New perspectives in endovascular treatment	2. Future developments in IV thrombolytic agents	3. Prehospital management of acute ischemic stroke	4. Genetics of stroke	5. Small vessel diseases	6. Heart and stroke	7. Neurosurgery in stroke	8. Diagnosis, risk factors and prognosis
4.77	4.73	4.59	4.14	4.73	4.82	4.45	4.55

Duration of each session							
Were the durations of the scientific session appropriate?							
1. New perspectives in endovascular treatment	2. Future developments in IV thrombolytic agents	3. Prehospital management of acute ischemic stroke	4. Genetics of stroke	5. Small vessel diseases	6. Heart and stroke	7. Neurosurgery in stroke	8. Diagnosis, risk factors and prognosis
4.73	4.73	4.77	4.50	4.77	4.82	4.73	4.73

Evaluation							
Please provide an evaluation for each session							
1. New perspectives in endovascular treatment	2. Future developments in IV thrombolytic agents	3. Prehospital management of acute ischemic stroke	4. Genetics of stroke	5. Small vessel diseases	6. Heart and stroke	7. Neurosurgery in stroke	8. Diagnosis, risk factors and prognosis
4.77	4.77	4.73	4.64	4.86	4.91	4.68	4.77



Interaction	Questions & Answers Sessions	Social events	Virtual format	Recommendation
Did you have the opportunity to interact with the speakers in the debate sessions, as possible as you expected?	Were the durations of the questions & answers sessions appropriate ?	Were the social events entertaining enough?	The ESO 2020 summer school was initially planned to be a face-to-face meeting. However, due to the Covid 19 pandemic, the format had to be re-organised into a virtual event. Did you experience issues with the virtual format?	Lastly, would you recommend attending the ESO summer school, even if this is a virtual event?
4.59	4.55	3.73	2.82	4.45

Participants were also allowed to leave free comments:

Free comments

It was a great event, with interesting and usefull topics. Thank you for the opportunity to participate
It was amazing

Wonderful experience

Thank you very much 4 this amazing summer school in the era of COVID-19.

1. I think it will be nice if give us a chance to visit the hospital and research workplace for more experience in the future summer school as well.
2. I think it will be a nice idea to let the students who joined the school to work out on a real clinical case scenario and to be presented as a PPT for a perspective of clinical and research purposes.
3. Regarding the certificate, it will be a nice idea if it doesn't written on it was held as a virtual one. Suggestion as "ESO/WSO Stroke Summer School, October 2021, Caen".
4. It will be a nice idea as well if all of the attendee will be the "winner" since all of them were attend the course virtually, and in fact all of them have a full paid summer school course including the accommodation and living expenses.

Thank you for the wonderful event. I think if it was face to face meeting there would be more interaction with experts and other participants which would enable to share knowledge and experience.

Presential better than virtual. May be 30' would be better for most of the sessions.



Once again thank you for great summer school

Thank you so much. I am glad to be the part of this school with professionals from different countries. That was cool.

Even though it was a virtual event, it was very interactive, I have successfully gained new knowledge and experience
 Congratulations for the programme, it was very interesting. I hope that the next meeting will be face-to-face
 Thank you
 Best,

The organisers managed to really make the best of this experience, given the limitations!





5. Participants

AZHARI Hala	(UK)
COLANGELI Enrico	(Italy)
DOBRI Ana Maria	(Romania)
DOGARIU Ioan	(Romania)
EMBRECHTS Elissa	(Belgium)
FENTER H�el�ene	(Switzerland)
FUERTE HORTIGON Alejandro	(Spain)
GAVRIILAKI Maria	(Greece)
HRYNYKHA Dmytro	(Ukraine)
JUBRAN Hamzeh	(Palestine)
KEKENADZE Miriam	(Georgia)
LEHT Laura	(Estonia)
MARTA Juan	(Spain)
NEHME Ahmad	(Canada)
ORNELLO Raffaele	(Italy)
PANAGIOTIS Stoiloudis	(Greece)
RIFINO Nicola	(Italy)
SCARCIA Lucas	(Italy)
SELLIMI Amina	(Belgium)
SHOROOQ Aladdin	(Israel)
SILVA L�enia	(Portugal)
SIMAAN Naeem	(Israel)
TSALTA Mihael	(Bulgaria)
VALLS CARBO Adrian	(Spain)
YOGENDRAKUMAR Vignan	(Australia)