



Paraspinal Near-Infrared Spectroscopy during TEVAR- procedures



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70TH ESCVS CONGRESS & 7TH IMAD MEETING



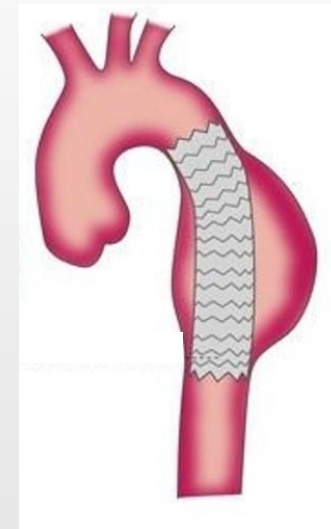
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NO conflict of interest!



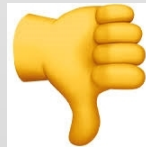
TEVAR and Spinal Cord Ischaemia



- **2-8%**
- **> coverage** of many **segmental arteries**
 - others: poor collateral blood supply
 - arterial embolization
 - spasm of microcirculation
 - haemodynamic instability
- **> delayed paraplegia**

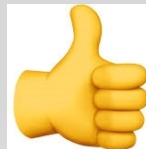
TEVAR and Neuromonitoring

- EACTS: “**MEP/SSEP** may be considered as an **intraoperative diagnostic tool** for **detecting Spinal Cord Ischaemia** in patients undergoing **TEVAR** at **High Risk** for SCI.” (level of evidence: IIbC)



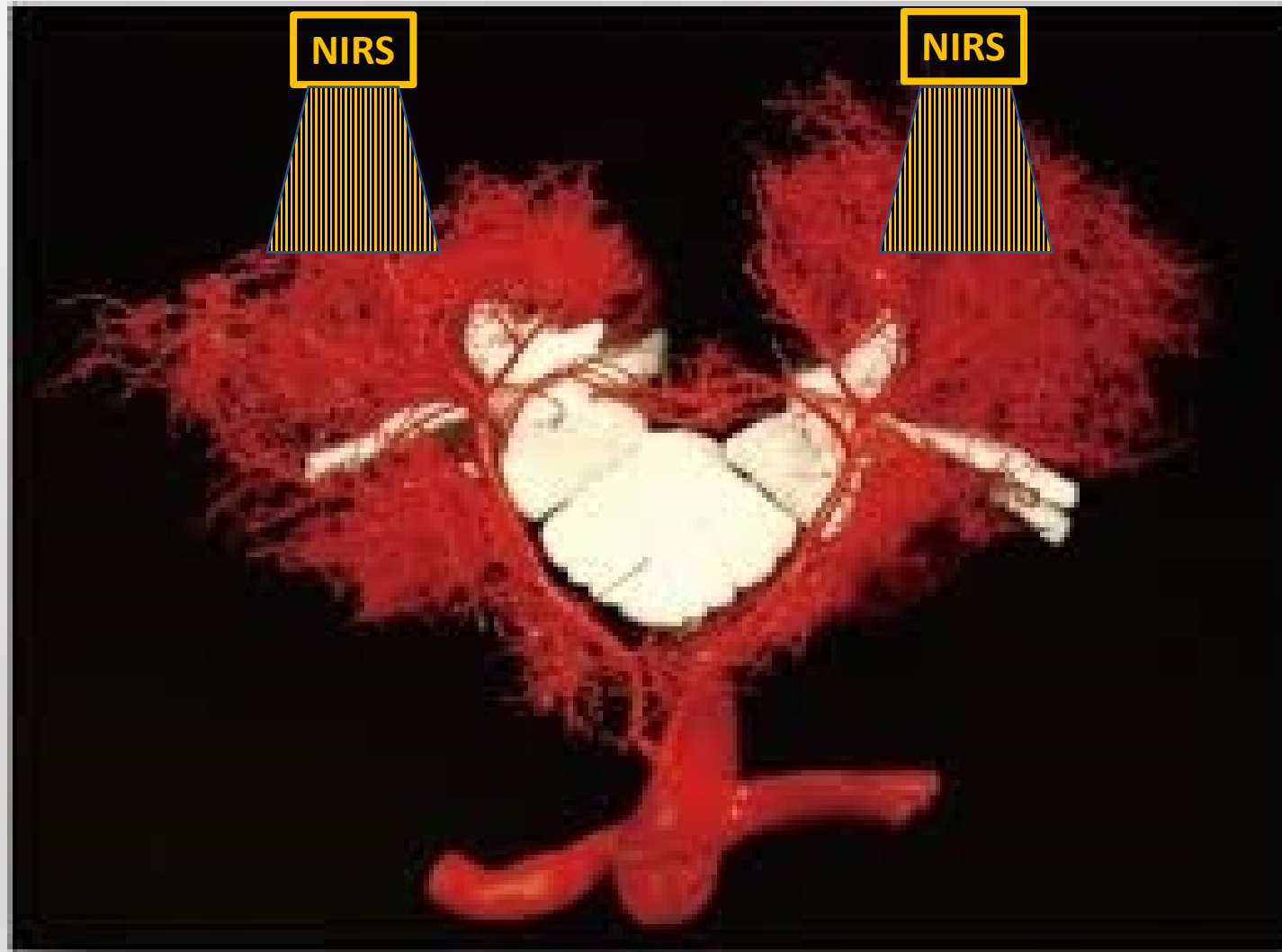
*Adaptation anaesthetic management
Not in the awake patient
Delayed Spinal Cord Ischaemia...*

- **Paravertebral NIRS???**



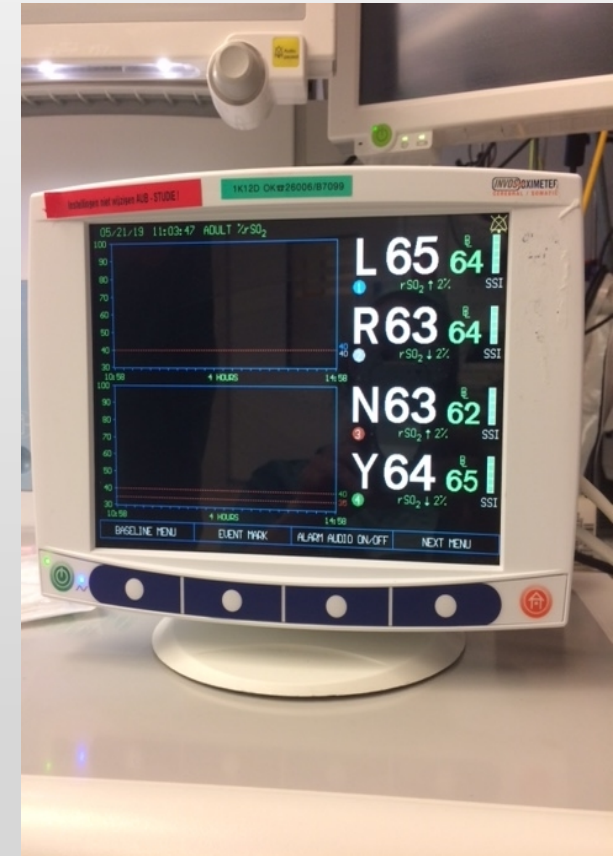
**Non invasive
Real time monitoring
Awake patient => postoperative period!**

Collateral Network Concept



Practical recommendations

- Paravertebral application
- Low thoracic and lumbar level
- Baseline setting: **awake, room air**
- **Cut off?** 20%?
- Monitor during **postoperative** period (delayed SCI!)



Near-infrared Spectroscopy Monitoring of the Collateral Network Prior to, During, and After Thoracoabdominal Aortic Repair: A Pilot Study

C.D. Etz ^{a,b,*,d}, K. von Aspern ^{a,d}, S. Gudehus ^c, M. Luehr ^a, F.F. Girrbach ^a, J. Ender ^c, M. Borger ^a, F.W. Mohr ^a

Eur J Vasc Endovasc Surg, 2013

20 patients: **3 TEVAR** with extended stent graft coverage

During *hypotension* and following *stent deployment*:

No significant **drop** in lumbar rS_tO_2 ($2.6 \pm 10\%$)

No paraplegia



Reservoir function of the collateral network

Retrograde blood supply (hypogastric arteries)

Anterograde blood supply (segmental arteries)

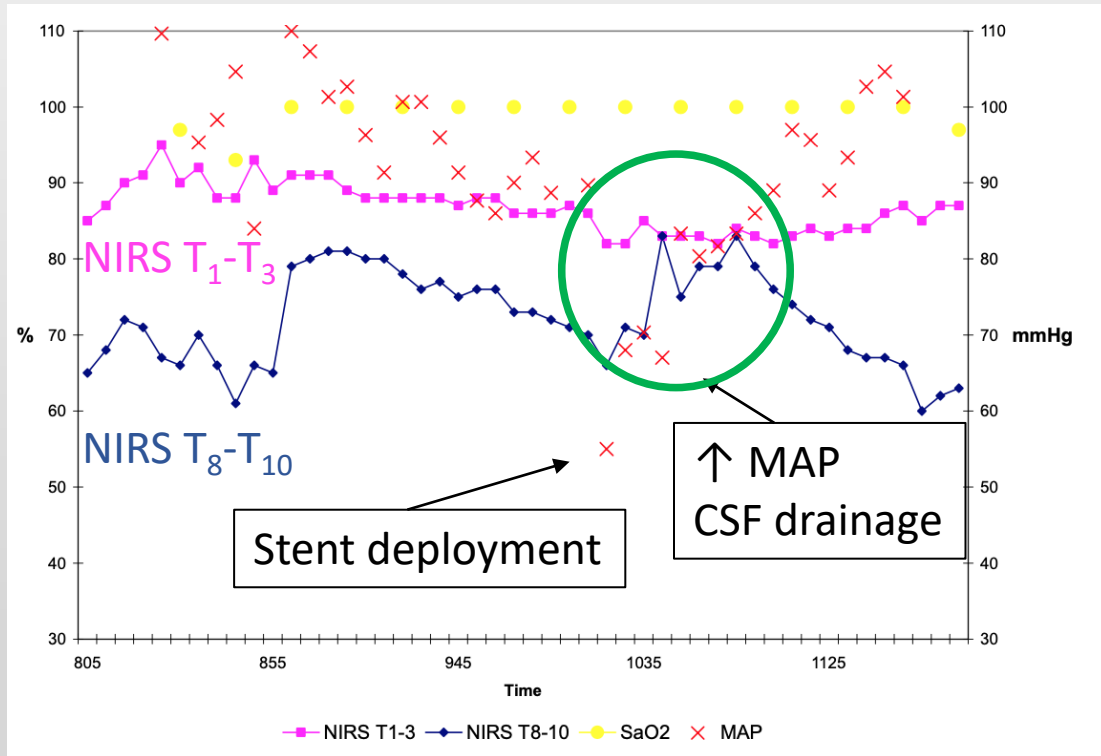
Use of Spinal Near-Infrared Spectroscopy for Monitoring Spinal Cord Perfusion During Endovascular Thoracic Aortic Repairs

Neal H. Badner, MD, FRCPC,* George Nicolaou, MD, FRCPC,* Colin F.M. Clarke, MD,* and Thomas L. Forbes, MD, FRCSC†

Male, 61 y

7 cm TAA (prox desc aorta => celiac artery)

Lumbar drain



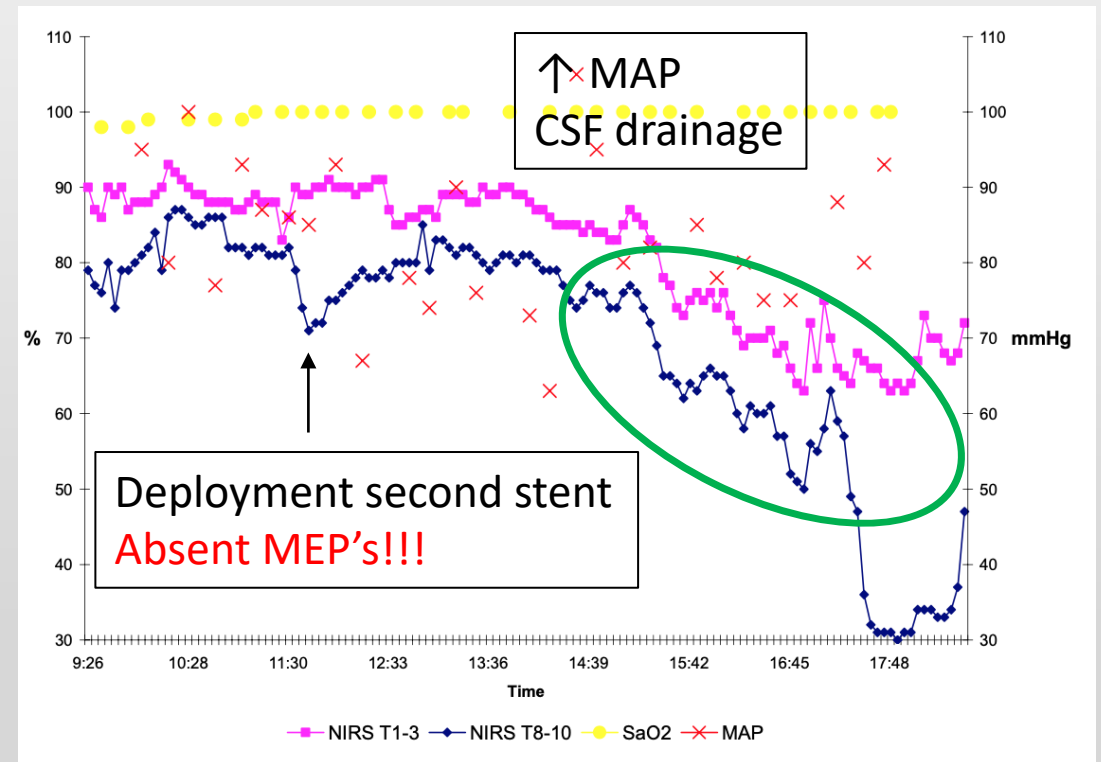
NO PARAPLEGIA

Female, 76y

7.5 cm TAAA (LSA => distal to renal arteries)

Left subclavian artery bypass

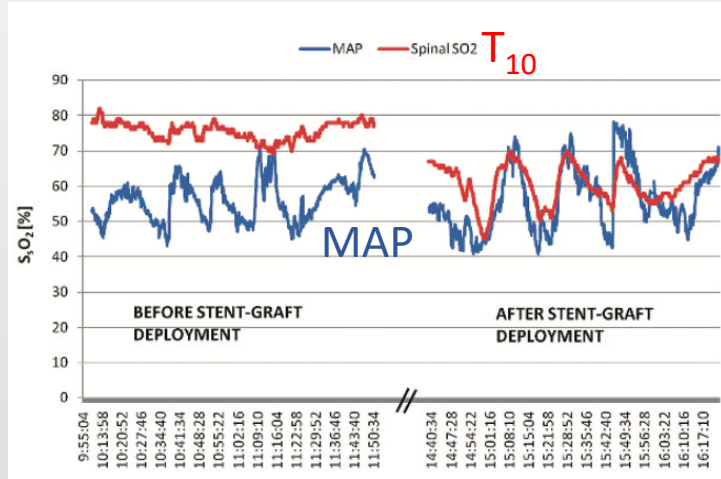
Lumbar drain, Tc-MEP monitoring



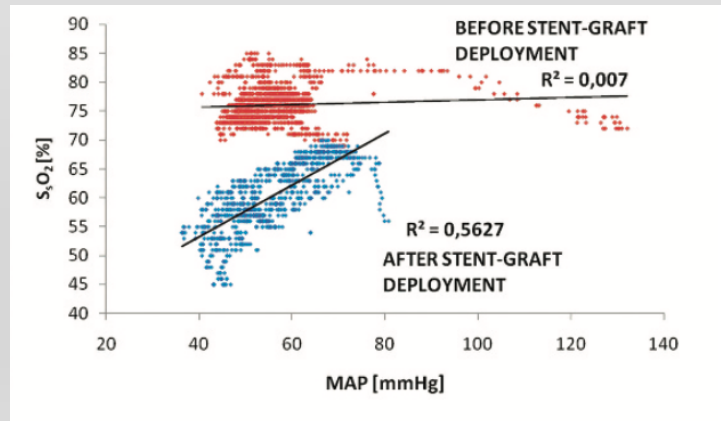
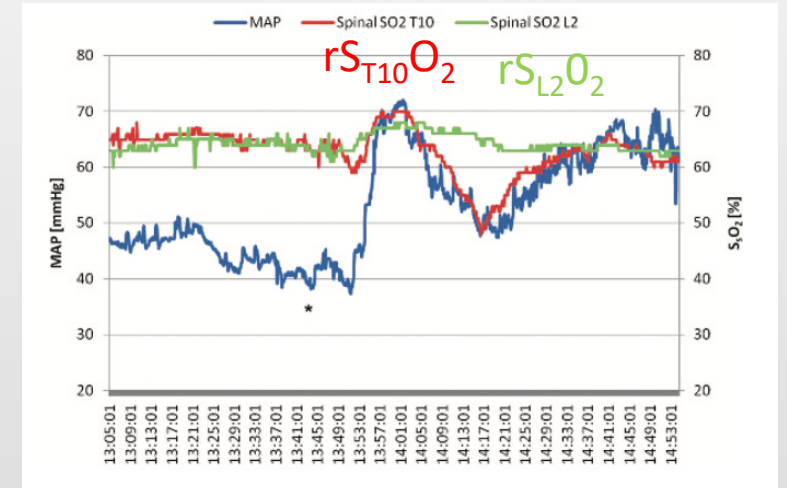
PARAPLEGIA

Near-Infrared Spectroscopy for Monitoring Spinal Cord Ischemia During Hybrid Thoracoabdominal Aortic Aneurysm Repair

Annelies Moerman, MD¹; Isabelle Van Herzele, PhD²; Caroline Vanpeteghem, MD¹; Frank Vermassen, PhD²; Katrien François, MD³; and Patrick Wouters, PhD¹

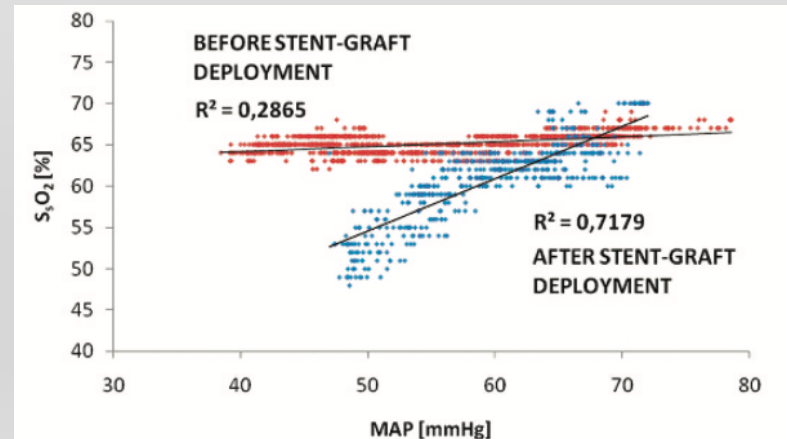


Male, 53 y
ATC: Bentall procedure
Chronic Ao dissection
(distal aortic arch => iliac arteries)
Lumbar drain



12 days

Staged repair



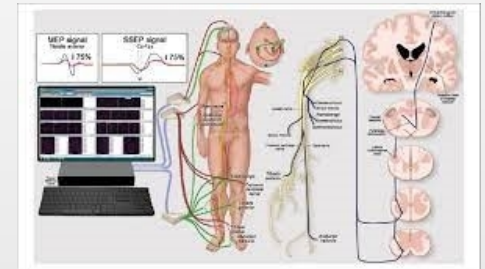
NIRS vs MEP/SSEP



Detection of Spinal Cord Ischemia During Endovascular Thoracoabdominal Aneurysm Repair Using Near-Infrared Spectroscopy Monitoring



C. Taylor Lewis,¹ Emanuel R. Tenorio,² Sharif Ellozy,¹ Christian D. Etz,³ Gustavo S. Oderich,² Darren B. Schneider¹. ¹NewYork-Presbyterian, New York, NY; ²Mayo Clinic, Rochester, Minn; ³University of Leipzig Heart Center, Leipzig, Germany



abstract

- 3 institutions (incl 2 physician-sponsored investigational device exemption studies), 109 pt



2 NIRS

1 NIRS together with MEP (43 pt)/SSEP (42 pt)



NIRS: > 20% decrease from baseline
MEP/SSEP: > 75% decrease in amplitude

- Sensitivity **NIRS** vs MEP/SSEP: **33%** vs 100%/100%
- Specificity **NIRS** vs MEP/SSEP: **99%** vs 10.2%/12.8%

NIRS: limitations

- Measures region **beneath** sensor
- **Interference**
- **Cause** of desaturation?
- **Outcome?**
- **Not validated**



TEVAR and paravertebral NIRS: Take home message?

- **Little information** available
- Collateral Network = **buffer**
- **Delayed paraplegia** => postoperative monitoring?
- **Cut-off** value: to be **discussed!**
- **Not validated** yet

THANK YOU!

