Remote proctoring for advanced embolization techniques
Disclosure

Speaker name:
Maximilian de Bucourt

I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☒ I do not have any potential conflict of interest
Agenda

Challenge

Remote proctoring

Embolization

Simulation
Vascular IR procedures (estimate worldwide 2016)

- Fempop PTA stenting: 1,561,644
- Iliac PTA and stenting: 792,319
- Infrapop PTA and stenting: 394,907
- Aortic Repair: 445,165
- Renal PTA and stenting: 357,897
- Carotid PTA and stenting: 174,886
- Renal PTA and stenting: 177,533
- Hemorrhage: 91,096
- Uterine Fibroids: 90,840
- Aneurysms/Enlarged: 58,784
- Vascular abnormalities: 71,699
- Cancer: 55,973

AT procedure data collection
Neuro - Mechanical thrombectomy

Driver 1:
Broader inclusion criteria

⇒ ≈26% procedure growth/a
(since Defuse 3 / DAWN etc.)
Neuro - Mechanical thrombectomy

Driver 2:
Coverage (gap)
Neuro - Mechanical thrombectomy

- Patients in the US
  - Thrombectomy eligible patient population: 80,000
  - Thrombectomies in 2016: 60,000

Coverage gap

- *onset <6 hours and ASPECTS ≥6
- Rai AT, et al., J Neurointervent Surg (9) 2017
Agenda

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Simulation
Remote proctoring

- experienced physicians (technical consultants)
- procedure support
- troubleshooting
- not physically present in the hospital
Remote proctoring

• experienced physicians (technical consultants)
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• troubleshooting
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⇒ “You-see-what-I see”
⇒ “bi-directionally interactive”
Remote proctoring

- 8" color-touch screen
- VGA/HDMI inputs (fluoroscopy, ECG, programmer,...)
- Audio headset(s)
- Webcam
- 3 internet connectivity options: LAN, Wifi, 4(5?)G
Remote proctoring

- Scheduling **Flexibility**
- In-house training tool: emergency support, proctoring.
- Hospital team empowerment
- Specific expertise for complex troubleshooting

“Better, Faster, more efficient support”

Scarlett, Medtronic pilot
Remote proctoring

**CONTACT**

Hospital staff connects the Scarlett station to power, LAN and signal sources (Programmer, Fluoro, webcam, headset,...)

**SHARE**

video and audio in Realtime

**INTERACT**

remote expert navigates hospital staff through implantation or troubleshooting

Scarlett, Medtronic pilot
Remote proctoring

Expert’s cockpit
Remote proctoring

Next generation
Remote proctoring

Data privacy

- secured environment (e.g. CISCO WebEx): audio & video / compression & encryption
- data/video storage not possible
- automatic anonymization
- connection only possible via console
Integration / robotics

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ABSTRACT
Background: Robotic-assisted percutaneous coronary intervention (R-PCI) has been successfully employed in the United States since 2011. Performing R-PCI from a remote location has never been reported but if feasible would extend availability of treatment to many patients with coronary artery disease (CAD) who would otherwise go untreated.

Objective: To assess the feasibility of remote tele-R-PCI with the operator 20 miles away from the patient.

Methods: Five patients with single, type A coronary artery lesions treatable by PCI consented to participate. The primary endpoint was procedural success with no major adverse cardiac events (MACE) before discharge. Procedural success was defined as achieving ≥90% diameter stenosis of the stented target vessel utilizing tele-R-PCI balloon angioplasty and stent deployment (ConCorPath Coronary Vascular Robotics, USA) without converting to in-hub manual PCI by an on-site standby team. Procedural, angiographic, and safety data were collected as were questionnaire scores from the remote operator evaluating the robot-network composite, image clarity, and overall confidence in the procedure.

Results: The primary endpoint was achieved in 100% of patients. No procedural complications or adverse events occurred, and all patients were discharged the following day without MACE. The operator scores were favorable with the operators rating the procedure as equivalent to an in-hub procedure.

Conclusions: Performing long-distance tele-R-PCI in patients with CAD is feasible with predictably successful outcomes if reliable network connectivity and local cardiac catheterization facilities are available.

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Integration / robotics
Integration / robotics

First in-human telerobotic PCI procedure from 20 miles away*
Dr. Tejas Patel, from Ahmedabad, India

First in-human neuro-vascular aneurysm coiling
Dr. Vitor Mendes Pereira, The Toronto Western Hospital, Canada
Agenda

Challenge

Remote proctoring

Embolization

Simulation
Embolization

Hannover Hospital & Medical School, Germany

Liverpool Hospital, Liverpool, Australia

Liverpool Hospital, Liverpool, Australia
Embolization
Embolization
Embolization
Agenda

Challenge

Remote proctoring

Embolization

Simulation
Cube 3.0 @ ECR 2020

explore
discover
play
learn

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