Looking Back

Looking Forward

Reflections from 40 Years in the OR
and Other Places in the Hospital...

Craig Vocelka, M.Div, CCP
Chief, Perfusion Services
University of Washington
Seattle, Washington USA
Before Gibbon

Harvey
  Father of circulation
Malpighi
  Described the capillaries
McLean
  Discovered heparin
John H Gibbon

1930
Began experimental work with extracorporeal circulation

1953
First successful use of cardiopulmonary bypass
May 6, 1953

Screen Oxygenator
Debakey Roller Pumps
Five Operations with one success
Never did another Open-Heart Surgery
Worked to Perfect CPB
History

1953  Gibbon performs first successful procedure utilizing CPB

1961  First meeting of technicians involved in extracorporeal circulation

1964  AmSECT formed

1975  I pumped my first case!
1975  Student at Texas Heart Institute
1977  Greuntzig 1st PTCA
1978  4000 Open Heart Procedures at THI
1980  5000 Open Heart Procedures at THI
1986  1st Coronary Stent
1987  University of Washington (1000 OH Procedures)
1989  Palmaz-Shatz Balloon Stent
2002  Drug Eluding Stent
2003  Cribier 1st TAVR
2011  FDA Approval in US
The BIG Question

What does the future hold for us, as perfusionists?
The Next 25 Years

I have heard that the amount of CABG and other invasive procedures have declined in the last 5 years as much as 40% in some cities. Furthermore, the use of extracorporeal technology is diminishing proportionately. It seems that practice is shifting toward percutaneous coronary intervention and other non-invasive procedures.

My obvious concern here is that there will not be enough work for new graduates, leaving us with tremendous debts to repay. Other healthcare professionals have warned me to not get into the field for this very reason and have tried to steer me in another direction, such as P.A. school.

Letter from a soon to be perfusion student
Cardiac Surgery Takes a Team

Captain of the Ship doctrine

The legal doctrine, a form of vicarious liability, that the legal responsibility for errors in a medical setting falls on the most highly trained or senior health care provider present at the time. This doctrine has been used to hold attending physicians or surgeons responsible for the negligent acts of the surgical or anesthesia team.

“Your individual talent alone is inadequate to the tasks that have been assigned to you.”

The Road to Character by David Brooks
Evolutional Concern

Pump Techs

Perfusionists

Pump Techs
What Will the Perfusionist in 2053 Be Doing?

Assist devices
ECLS // ECMO
Organ preservation
Organ banks
Surgical Suite

Congenital repair
Surgical Suite

Congenital repair

Transplant
Trans Medics Heart Preservation System
XVIVIO Perfusion System (XPS) includes:

ICU ventilator

Centrifugal pump with flow, level, pressure (2) and temperature (2) sensors

In-line perfusate gas monitors

Heater/cooler unit (15-39°C)

Fluid-management pumps (3)

Touchscreen computer and display-only monitor

Custom software to monitor perfusion devices
Surgical Suite

Congenital repair
Transplant
Trauma
Surgical Suite

Congenital repair
Transplant
Trauma
Neurosurgery
Surgical Suite

Congenital repair
Transplant
Trauma
Neurosurgery
Chemotherapy
ICU

ECLS // ECMO
Outside of the Hospital

ECPR
Transport
“I believe that the future of our profession lies within the profession itself. Perfusionists must perform our craft in a manner that never begs the question of replacement with less expensive or less specialized personnel. As individuals, as teams and as a profession we must branch out and share our unique knowledge base with other healthcare professionals, especially in the areas of ECMO, EX-Vivo, HIPEC and autologous cell salvage.

The modern perfusionist will succeed if they are business savvy, politically appropriate and well versed in the pursuits they choose to delve into. New graduates have hugely diverse professional and social backgrounds which will only strengthen our profession as they put their talents to good use.”

William Riley, CCP  Boston Children’s Hospital
Thoughts of Others

“I believe that surgical and diagnostic innovation combined with new technology will open new doors and windows of opportunities for the perfusionist. Our future demand should steadily increase with surgical/diagnostic innovation and technological advancements in ECLS, VAD’s, total artificial hearts, ex vivo organ perfusion, tissue engineered organs and transplantation.”

Bradley Kulat, CCP Coordinator of Perfusion Services at Ann and Robert H. Lurie Children's Hospital of Chicago
I believe the future of perfusion and our scope of practice will be different 10 years from now. The most important thing at this time is that I believe perfusionist need to embrace gain skill set in other areas of the hospital especially the cath labs and CVICU settings. I also believe that perfusionist seriously need to consider taking back the ECMO. I understand the financial aspect of having perfusionist monitor ECMO; but at the same time I also believe, which is more important, that there is direct patient impact in quality of care delivered due to the skill set of a perfusionist vs an ecmo specialist. No disrespect to them. Surgical valvular repairs will drastically drop, as it has already for Aortic valves, soon mitral valves as centers, including ours, have already started being part of clinical trials for percutaneous MVR.
We as profession will persist for a long time as we will always be needed; however, the number of perfusionist needed will be much smaller than it is today. Currently there is a shortage of perfusionist, probably, worst I have seen in 17 years; however, with healthcare economy the direction it keeps going, I believe many smaller cardiac centers will be forced to shutdown due to changes in policies by CMS. The perfusionist that will persist will be the ones that are willing to adapt today and embrace change. The younger perfusionist living their lives in the "status quo" lifestyle will pay the price. Resource will be decreased, but the expectation of quality of care will continue to go up. Perfusion program directors need to focus on training students for the the distant future, which is not the same as today.  

Kirti Patel Univ Texas
The Future

The future is always beginning now.
Mark Strand

Only you can control your future.
Dr. Suess
Thank you for your attention

It is truly an honor for me to be with you this week.
1956 Lellehei and DeWall

Bubble Oxygenator
Simple to use - helix reservoir (beer hose)
Disposable, inexpensive
Parts cost $15.00
Defoaming agent - Dairy Industry
Dairy Pump
Lellehei Bubble Oxygenator
Travenol 6 LF Oxygenator
Travenol Bubble Oxygenator
TMP VenoTherm
Bentley Temptrol
Galen Bubble Oxygenator

Diagram showing the various components and ports of the Galen Bubble Oxygenator, including:
- Water inlet-outlet
- Injection ports
- Defoaming area
- Sampling port
- Oxygenating column
- Heat exchanger
- Arterial reservoir
- Oxygen inlet
- Coronary perfusion outlet
- Venous inlet
- Cardiotomy inlet
- Arterial outlet
Harvey Bubbler
Shiley Bubbler
The Present and Future State of Minimized Extracorporeal Circulation

Meng, F and Yang, M
School of Electronic Information and Electrical Engineering, Shanghai Jiao Tong University, Shanghai

Zhongguo Yi Liao Qi Xie Za Zhi. 2013 May;37(3):203-6. (Chinese Journal of Medical Instrumentation)