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HEATED INTRAPERITONEAL CHEMOTHERAPY

AmSECT

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COLUMNS

AmSECT'S ACHIEVEMENTS

It is hard to believe that two years ago, as I write this message, I was set to begin serving AmSECT as president. It seems like yesterday. Having served for two years as President-elect under then-president Jim Reagor, I had some grounding for the role and realized I had very big shoes to fill. The Strategic Planning Committee helps strategize for AmSECT's future and determine where our energies should be focused over the next two years. At that Strategic Planning Meeting, we sat and reflected on recent successes and identified newer needs of the perfusion industry and community, as well as additional ways to engage and support the members of AmSECT. I proudly presented the 2022-2024 Strategic Plan at AmSECT International that year. AmSECT's achievements result from dedicated volunteers moving those planned initiatives forward.

Over the last two years, the Membership Committee has built significant momentum. They have added new committee members and worked diligently on ideas for increasing engagement with our members. Our Quality Improvement goal has been a work in progress for several committees.

Tami Rosenthal, *MBA CCP FPP*

The ICEBP has completed endorsements for the newly updated AmSECT Standards and Guidelines version as they continue to work on additional policy and practice resources. The Safety Committee re-launched their webinar series with a successful webinar on checklists. Keep an eye out for additional webinars on QI topics! PediPERFORM, the pediatric registry, had a successful launch with seven centers currently enrolled and a lot of interest from pediatric centers.

Our partnership with Oruum is still in its early stages, but the first report was very insightful and thought-provoking. I look

WHAT HAS IMPRESSED ME MOST DURING MY TIME WITH AMSECT IS THE NUMBER OF HARD-WORKING VOLUNTEERS AND THEIR FOCUS ON IMPROVING PERFUSION EDUCATION FOR OUR COMMUNITY.

forward to seeing what a difference event reporting will make for our profession. The Communication Task Force has increased our social media presence and collaborated with all the committees to develop a process for the different groups to share their projects and accomplishments on social media. They are exploring the idea of a year-round app across the different platforms to make gaining access to tools and resources easier on the go. In addition, we are evaluating the idea of transitioning the Communications Task Force to a permanent committee, as how we interact with data and communications is constantly changing.

Education, a core aspect of the AmSECT mission, has seen significantly increased activity in the last year. AmSECT U has launched multiple new modules, including the CES-A and the CES-P exam and education modules. The JECT Journal had a monumental year with the transition to EDP Sciences and the journal becoming open access. Now any interested individual has access to every article without a subscription firewall.

As a society, this has also been a big year for AmSECT with our change in management company to Ewald Consulting. The request for proposals (RFP) task force worked diligently to discover the best partner available for AmSECT. We look forward to realizing the benefits of our partnership between AmSECT and Ewald under the executive leadership of Peter Black.

In closing, it has been an honor to serve as President of AmSECT. What has impressed me most during my time with AmSECT is the number of hard-working volunteers and their focus on improving perfusion education for our community. The society is in great hands with incoming President Scott Snider and the Board of Directors of AmSECT. They will continue to advance AmSECT into the future.

Thank you for allowing me to serve you and AmSECT.

HEATED INTRAPERITONEAL CHEMOTHERAPY

Keith C. Bryant, MHS, BSN, CCP

As illustrated in the last issue of *AmSECToday,* perfusionists have the knowledge and expertise to perform far more hospital procedures than just cardiopulmonary bypass. One of those procedures being used with increasing frequency is heated intraperitoneal chemotherapy or HIPEC. This procedure, as the name implies, involves the circulation of heated chemotherapy solution in the abdominal/peritoneal cavity with the aim of destroying any remaining cancer cells too small to be removed in the cytoreductive surgery (CRS) performed just prior to HIPEC. This is considered a palliative procedure, as these types of metastatic malignancies are considered terminal. However, many studies have shown that CRS with HIPEC can double the expected overall survival (Samuel J Klempner, 2021).

History

The potential benefits of circulating heated chemotherapy solution in the peritoneal and abdominal cavity to slow the progression of aggressive malignancies have been explored nearly as long as cardiopulmonary bypass. First used in gynecological cancers in the 1960s, benefits were seen in abdominal cancers in the 1980s. Dr. Sugarbaker was an early pioneer in HIPEC, authoring several books and publishing many papers, helping establish the current HIPEC practice standard. As HIPEC has grown and evolved through research in Japan, Europe, and the US, there are now over 100 institutions that offer HIPEC in the United States alone (Colette R. Pameijer, 2022).

How Does HIPEC Work?

HIPEC uses the inherent susceptibility of cells to destruction when exposed to high temperatures. While healthy cells will be destroyed at 45 degrees Centigrade, malignant cells are slightly more sensitive, with exposure to temperatures of 41-43 degrees being enough to prompt destruction. The high temperature also enhances the penetration of certain chemotherapeutic agents into the malignant cells, increasing their effectiveness. Malignant cells have more lysosomes than normal cells, leaving them primed to assist in cell destruction. The enzymatic digestion process of these waste disposal systems of the cell is enhanced by heat and increases the destructive capacity. In contrast to most normal cells in the body, malignant tumors respond to heat with profound vasoconstriction or even stasis in response to heat. In addition, hyperthermia depresses or inhibits oxidative metabolism, leading to lactic acid buildup, enhancing lysosome activation, and prompting malignant cell apoptosis. When you add certain chemotherapy medications tailored to the malignancy and whose effect is potentiated by heat, HIPEC is highly effective

AS PERFUSIONISTS, WE TAKE PRIDE IN SOLVING PROBLEMS AND DEVELOPING SOLUTIONS. OUR KNOWLEDGE OF EXTRACORPOREAL CIRCULATION PUTS US IN A UNIQUE POSITION TO AID OUR SURGICAL ONCOLOGY COLLEAGUES IN THEIR PRACTICE.

in accelerating malignant cell destruction (Santiago González-Moreno, 2010).

Role of Perfusion

The HIPEC circuit is remarkably simple in construction. It consists of a reservoir, pump, heat exchanger, an infusion cannula, and a drainage cannula. There must be an area to inject the chemotherapeutic agent safely into the reservoir and a way to administer more crystalloid into the system as needed. There also must be a way to monitor the temperature of the solution as it enters the patient and precisely control the temperature of the water through the heat exchanger. Drainage and return pressure monitoring and the ability to add vacuum to the reservoir are also helpful.

One of the difficulties during HIPEC is keeping the cytotoxic solution heated enough to where it is most effective on cancer cells while not so hot that it causes healthy cell destruction. This requires equipment that can heat the solution to a point between 41 and 43 degrees Centigrade as it enters the body. Due to safety restrictions placed on manufacturers of cardiopulmonary bypass heater/coolers, you cannot use a stock machine to get the solution up to an effective temperature. Some vendors have HIPEC-specific delivery systems that simplify the procedure through disposable sets, tailored cannulas, and precision heaters that achieve and maintain the goal solution temperature. However, they are expensive.

As perfusionists, we take pride in solving problems and developing solutions. Our knowledge of extracorporeal circulation puts us in a unique position to aid our surgical oncology colleagues in their practice. Many centers have worked with heater manufacturers to apply for specific exemptions from the FDA and alter their heaters to achieve the appropriate temperatures needed for HIPEC. Creative perfusionists have also used the disposables and equipment they have on hand to construct a circuit that can function to the precision necessary to perform this therapy. As oncology surgeons refine and standardize the procedure, HIPEC is expected to increase in availability. Many existing HIPEC centers have seen a dramatic increase in the number of cases being performed. As perfusionists, we can position ourselves to take on this role as experts in extracorporeal circulation and add this new therapy to our skillset.

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(ThermaSolutions, 2024)


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THE COMPLEX SOCIAL SYSTEM OF THE OPERATING ROOM:
WHAT THE SOUTH PACIFIC TAUGHT ME ABOUT THE HIDDEN DRIVERS OF TEAM PERFORMANCE AND SAFE SURGERY

Courtney Petersen, CCP MPS

In October 2023, I took part in a medical mission in Fiji, where we completed 25 high-risk open-heart surgeries on rheumatic heart disease (RHD) patients and replaced 45 valves in 6 days. Every single disposable and piece of equipment used on that medical mission, from check-in to discharge, was brought over on ships and planes from New Zealand and other countries. All surgical, clinical, critical care, prep, sterilising, and re-stock working spaces were constructed from a blank canvas in a matter of days. Within three days of the first group's arrival, rooms were buzzing, our first patients were on the table, and off we went. Performing our highly specialized jobs in a multidisciplinary, multicultural environment with strangers we'd only just met, the equipment we'd only just assembled, and many hours of troubleshooting barely behind us. And yet 18+ hour days, 25 patients, and six days came and went without a single mortality, late-night bring back, or major complication.

One evening, a few of us reflected on the strong team dynamics and positive outcomes. What was driving this success? The comforts of home that would presumably lead to safe surgery on paper, we didn't really have. We experienced stress and fatigue, deviations from standard practice, heavy workloads, and information overload, which can pose risks to patient safety.[1] However, what *was* present was a heightened awareness that we are a deeply interconnected system relying on each other in a multifaceted, high-performance environment with a shared mutual goal. It felt almost simplified to view our work through the lens of our interactions, attitudes, and how we communicate and react — or, in other words, teamwork.

It required an undeniable focus on the more intangible practices, often referred to as soft skills, which most of us were never taught but are shown to play a crucial role in the overall health and function of a social system, a team. The success of the Fiji heart mission and any surgical operation is multifactorial and complex — there is not one single theme we can point to and proclaim to be the supreme solution. My use of storytelling and exploration is intended to peel back a few layers and discover what role soft skills such as nontechnical skills, emotional intelligence, and psychological safety may have played in our team's effectiveness and positive outcomes, which could benefit future surgical teams and clinicians in the delivery of safe, high-quality care.

Errors, accidents, and mis-communications will happen in surgery. Human error is an inevitability. Increasing evidence suggests patient harm is far more likely to occur from poor decision-making than poor technical skills. In fact, technical errors during surgery constituted just 4.3%, according to the 2010 Scottish Audit of Surgical Mortality.[2] Further studies have found that deficient teamwork is key in adverse events that lead to patient harm.[3,4]

The importance of teamwork is cited regularly in the workplace, but it is vague enough not to encourage real action or provide direction. Improving teamwork may benefit technical performance and patient outcomes, but what does that look like?[5] Soft skills further explore and define the scope of teamwork. Soft skills are related to the interaction among people and how they deal with tasks.[6] As we drill down to what that involves, nontechnical skills such as decision-making, situational awareness, task management and leadership, teamwork and communication emerge to complement technical skills and further enhance the framework needed to achieve safe surgery for our patients.[7] When applied to surgical team composition, these skills may support the development and growth of emotional intelligence in individuals and naturally construct a culture of psychological safety.[8]

While operating in Fiji, these soft skills felt like all we had within our control amid a quickly evolving environment. Unsurprisingly, uncertainty simplifies the big picture and elevates the basics — constant and robust information exchange between clinicians, collaboration, feeling safe to speak up, controlling emotions around decision-making, and uninterrupted focus. Many of these themes were achieved on our mission through simple processes that are now performed with a high level of compliance in operating rooms throughout the world since the World Health Organisation (WHO) released the quality tool Surgical Safety Checklist (SSC), specifically team briefing and debriefing.[9]

A calming reset and mutual connection are encountered during an intentional team brief before surgery. External distractions, interpersonal conflict, and other stressors inevitably find a way into the operating room and can negatively influence the social system. We used the team brief to humanize the patient and remind us of the reason for the work. A 21-year-old with dreams of becoming a pilot dashed after she was diagnosed with RHD at age 18 is now able to apply for flight school. A 35-year-old crown prosecutor with two teenage children nearly too sick for her flight to the hospital and suffering from RHD and worsening biventricular failure since 2011. A 16-year-old who received three valves and recovered well alongside his schoolteacher mother. This was the reason we were here. We knew them by name and face, not just on paper.

The time allotted for the equally important sign-in and timeout was more technical, operational, systems, and checklist-based. But that first team discussion based solely on the patient and the life that we were hoping to return to them after rheumatic fever unforgivingly ravaged their heart valves felt monumental and powerful. A collective mental retune.

Additionally, this team brief promoted psychological safety or the shared belief that the team is safe for interpersonal risk-taking and improved innovation and error prevention.[10] A profound sense of purpose towards the patient and clear situational context seemed to naturally cultivate a willingness for any colleague to raise safety concerns as they occurred and feel confident in themselves and the team dynamics to do so. Conversely, we know that an environment that does not allow for speaking up, asking questions or for help, sharing information, or discussing mistakes has been shown to increase the odds of major complications or death.[11]

Long days and early mornings with minimal downtime meant measured interactions with each other were crucial to maintaining a cohesive atmosphere in the operating room. Emotional intelligence (EI) has been recognized as a powerful tool for better performance and benefit to patients and staff. A person's ability to manage emotions and respond appropriately under stressful situations is critical in our surgical environment. Along that same thread is recognizing the effect that our behavior has on others within the team. Fiji had a way of placing these considerations under a magnifying glass due to fatigue and elevated stress under the conditions we experienced. Predictably, emotions would run high, and anger or frustration may present a crack in the foundation. Instead of leading to a snowball effect or

NONTECHNICAL SKILLS SUCH AS DECISION-MAKING, SITUATIONAL AWARENESS, TASK MANAGEMENT AND LEADERSHIP, TEAMWORK AND COMMUNICATION EMERGE TO COMPLEMENT TECHNICAL SKILLS AND FURTHER ENHANCE THE FRAMEWORK NEEDED TO ACHIEVE SAFE SURGERY FOR OUR PATIENTS.

breakdown, the rest of the team would respond with empathy, waiting and allowing emotions to settle before acting. This required both individual EI and a collective team acknowledgment and a unified response in the absence of words.

What struck me the most during the Fiji Heart Mission was not that challenging events occurred. If anything, the unexpected happened more frequently in this environment, as expected. It was how a group of strangers became such a strong, safe, cohesive, and high-functioning team despite the numerous daily hurdles and avoided any critical breakdown that stood out the most. The surgical team navigated fatigue, communication challenges through language barriers and accents, surgical emergencies requiring immediate high-level team response, equipment issues, high emotions, and workflow disruptions.

As clinicians, we know how to do our job. There is comfort in standing at our respective positions in the operating room because we are prepared, competent, and expertly technically trained as individuals. However, we also know that an emergency heightens emotions and derails teams, with one minor error often leading to many more preventable errors. The power of soft skills such as nontechnical skills, emotional intelligence, and psychological safety to keep that system functioning, avoid breakdown, and ultimately support patient safety are tools we should search for and develop within ourselves and our environments, whether across town or the Pacific.

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Courtney Petersen, CCP, MPS

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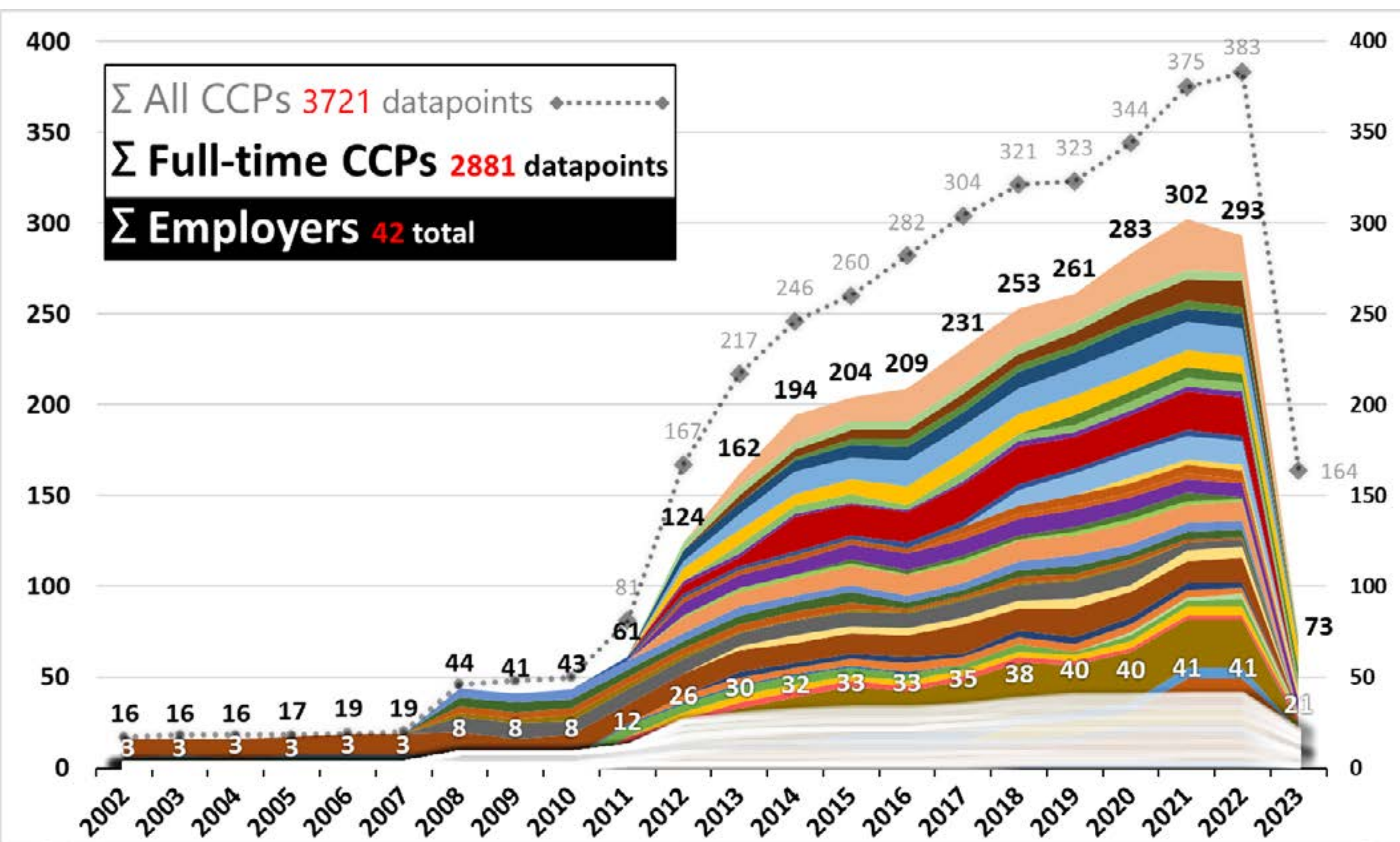
PERFUSION PAY, PART TWO: HISTORIC TRENDS

Brent Thye, CCP

Affairs, death, or politics; please talk about anything but *money*! Substantive conversations about how much people earn can be uncomfortable, but it is difficult to make fair and honest comparisons without a frank and open discussion. This research was presented initially at the CREF™ (Cardiothoracic Research and Education Forum) meeting in September 2023. Additional data have since been collected as this is an ongoing personal project, completed on my own time and dime. All data were gleaned from publicly available sources, and numbers will continue to be updated as additional data are collected. This work is a sister project of this author's previous article: "Perfusion Pay, Part One: Transparency" published in the 4th quarter 2023 edition of *AmSECToday*.

50+ records requests were filed in 2023 to collect historical perfusion pay data. The inclusion criteria were simple: any employer of perfusionists in the United States subject to open records requests. Employers of all stripes contributed, from single-person practices to large departments across the country. Significantly, the data are reported from employer databases, making it more in-depth and reliable than individual survey responses. While this cross-section may not be entirely representative, it is highly enlightening and definitive data. By utilizing this large pool of transparent data, every perfusionist can now moor themselves to facts when contemplating their own compensation and analyzing current trends.

A total of 3,721 data points, each representing one year of earnings for a single perfusionist, were aggregated from employer databases. This is a rich dataset to analyze, including 42 employers, up to 20 years deep, cumulatively covering 688 unique perfusionists. Employers provided varying depths of data. A tranche of 2881 data points, each representing an individual



perfusionist employed **full-time** for an **entire year**, was utilized to provide an even basis for comparison. Data for 383 of the 4413 ABCP-certified perfusionist workforce in the United States were collected, representing 8.6% of all ABCP-certified perfusionists in 2022 in the United States.

$202,691 was a perfusionist's average total earnings in 2022, based on 275 *full-time* perfusionists whose employers reported total pay data. The total earnings metric is base salary + overtime earnings + call pay + any other additional pay received. The **median** total pay was $197,042, indicating a relatively symmetrical distribution. On first blush, total earnings appear cut-and-dry. However, delving further into this data reveals a more profound complexity: 2022 full-time total earnings data **range** from $109,237 to $390,791 with a **standard deviation** of $48,645. These data demonstrate considerable variability in full-time perfusionist total pay. The 2022 average **base pay** was $169,374, N=238. The overall **highest**-paid individual perfusionist in this data set hailed from the Northeast region in a very high cost-of-housing area and earned $477,214 in 2021, therefore is not included in the 2022 pay distribution graph.

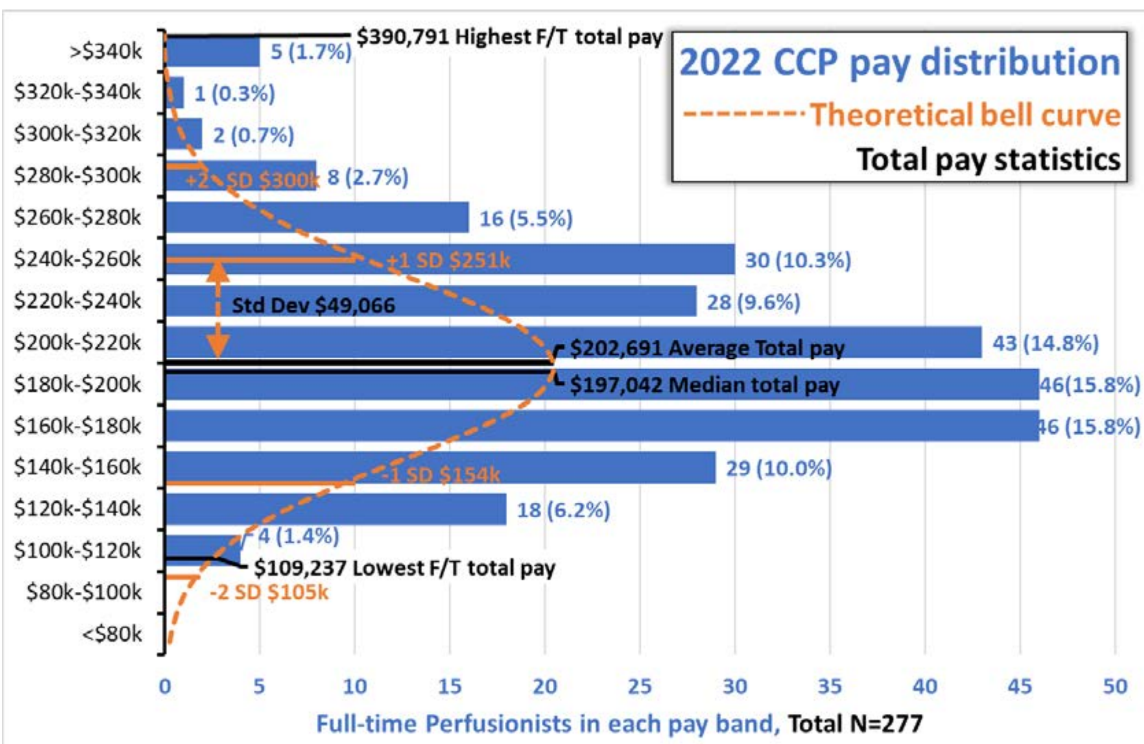
20.1% above base pay is what the average perfusionist earned in 2022, N=222. A principal distinction to make is between base pay and total earnings. The majority of respondent institutions, N=32, reported both base pay and additional pay data such as overtime, bonuses, or "other" earnings categories, even if zero. These additional data points allow us to better analyze the interplay of base pay, total pay, and year-over-year changes. Eight of those 32 (25%) reported paying **little to nothing** beyond base pay in 2022, demonstrating the relative rarity of base pay equaling total pay. Alternatively, eight other employers reported only **total** earnings data, obscuring their specific earnings category attributions. One employer reported only base pay and thus was excluded from the total earnings graphs and analysis.

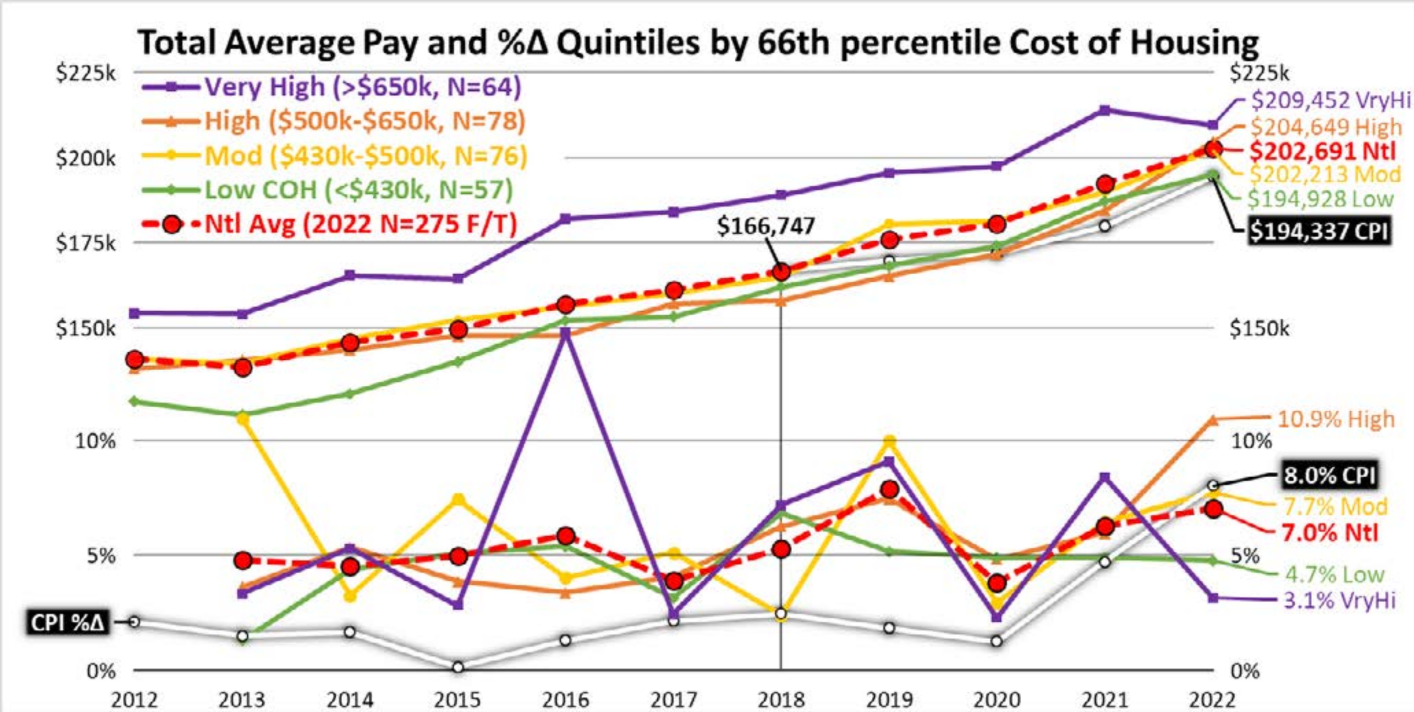
38 employers provided data from 2018 to 2022. This subset covers 250+ full-time perfusionists annually, creating the highest fidelity data for comparison. Concentrating on the most recent data also gives a pre- and post-pandemic view of pay and the evolving response to elevated inflation rates.

7.0% is the average total earnings growth in 2022 of the 239 individuals employed full-time in 2021 and 2022 at the **same facility**. This is not referred to as a "raise," as this is a measure of total earnings, not just base salary. This figure falls under the federally reported national consumer price index (CPI) inflation rate of 8.0% for 2022. Taking the 2018 national average total pay of $166,747 and indexing that to inflation each year, we arrive at $194,337 for 2022, showing the "average" perfusionist beat inflation to the tune of $8,354. The annual percentage change often has huge, sometimes diametrically opposed, variability from employer to employer and year to year, including some uncommon instances of total pay falling. It is exceedingly rare for any employer to reduce an employee's base pay. Therefore, when reductions in **total** pay do appear, they are typically a factor of lower earnings above base pay (think less overtime, call, or bonus pay).

$14,524 is the **difference** in **average** total pay between those in "Very High" cost-of-housing (COH) areas versus "Low" COH areas. The previous article in this series posited, discomfitingly, that COH has a disproportionately **low** impact on perfusion salaries compared to other healthcare professionals. The imperfect method reported in that article was modified slightly for this report:

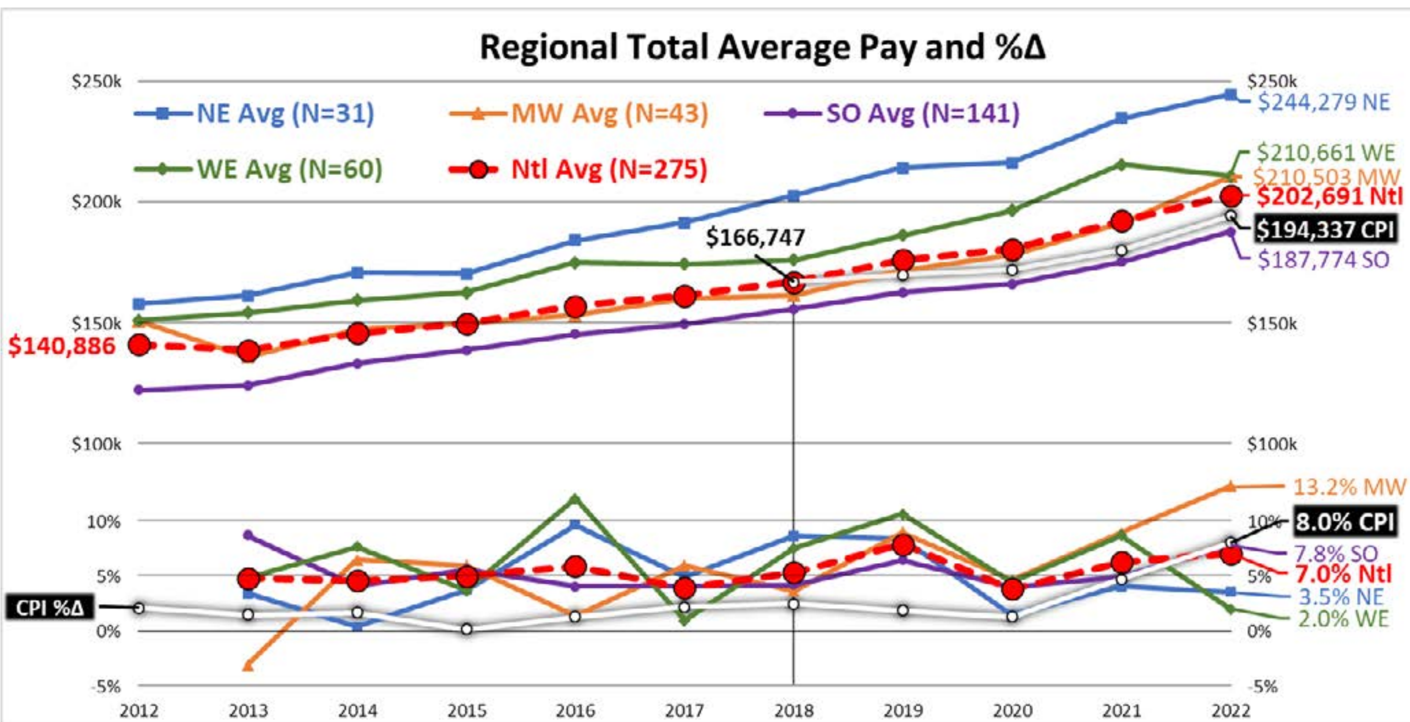
For each employer 1) Draw an approximately 20-mile radius circle around the hospital; 2) Find every house sold recently in that circle and arrange by price; 3) Select the house at the 66th percentile cost level; 4) Divide the individuals into four





approximately equally populated quartiles based on the cost of housing. The resulting house price quartiles are: Low COH <$430K, Moderate COH $430K-$500K, High COH $500K-$650K, and Very High COH >$650K. The finding here seems further to bear out the previous hypothesis in hard numbers. Whereas those domiciled in Very High COH areas have historically received a sizable premium, $27K more than Low COH in 2021, it was trimmed down to $14,524 in 2022. For the high-fidelity data period since 2018, there is very little difference between low, moderate, and high COH areas; they all have very similar pay **averages**. The average annual percent change shows that all four groups consistently, and sometimes considerably, beat national CPI. That is, until 2022, when **only** those in the High COH (+10.9%) group outpaced the 8% CPI and all others fell under inflation (Mod +7.7%, Low +4.7%, and VryHi +3.1% vs. national CPI +8.0%), thus eroding their year-over-year purchasing power.

23.1% is the average pay difference between perfusionists in the Northeast and South regions. Breaking it down regionally introduces additional nuance. The Bureau of Labor defined regions of West, Midwest, Northeast, and South were utilized because they each have specific CPI indices. Since 2018, total earnings growth has generally outpaced region-specific inflation metrics, except in 2022 when West CCPs (+2.0% vs. West CPI +8.0%), Northeast CCPs (+3.5%



vs. NE CPI +7.0%) and South (+7.8% vs. South CPI +8.6%) regions underperformed their region-specific CPI metrics. Midwest (+13.2% vs. MW CPI 8.0%) maintained a significant edge above their CPI metric.

$46,488 is the average value of benefits per full-time perfusionist provided by employers in 2022, n=38. While it is easy to understand the concrete base salary a position offers, and it is possible to hypothesize total earnings, a position's best overall financial measure is the total compensation metric, equaling total earnings plus benefits value. Only a small plurality of 5 employers reported the value of benefits provided, making this data less-than-actionable despite being a significant facet of total compensation, representing approximately 25% of the average total pay. Benefits value is exceedingly difficult to assess as it varies significantly depending on the benefits offered and any cost sharing. Retirement benefits are usually a simple percentage contribution, but the later **derived value** depends on a myriad of factors, not to mention differences for those who receive a pension benefit. Insurance (health, dental, vision, life, disability, pet, malpractice) costs paid on behalf of the employee are not easily elucidated. Assigning value to paid time off is both a personal and financial calculus. While the total compensation value is the most accurate value metric, it is also the most complex to calculate, rarely disclosed, and somewhat subjective by nature.

91.6% of all perfusionists are missing from this dataset. There is **no** accounting for years of experience. The number of hours each full-time perfusionist is clocking is an **unknown**. The cost of living is **not** fully controlled for. All major figures are **averages**, so while broadly instructive, they may not reflect individuals' lived experiences. There is **no** IRB review/approval as this research project does not involve using private or individually identifiable data. The reference section is, however, **highly redacted**. While the data are publicly available, given the intensely personal nature of individuals' compensation, de-identifying the underlying data is paramount to facilitating an honest, open, and detached conversation. As part one in this series observed: pay transparency is an emerging trend to which not everyone has grown accustomed, let alone embraced.

$1 Million question: what are the mechanisms driving these trends? Are these trends sustainable? What comes next? How can these data be harnessed? These are complex questions left unanswered. A natural question to which I can provide a definitive answer: why are no 2023 data presented? Complete equivalent data for 2023 will **not** be available until December 2024. The wheels of data collection turn at the speed of the individual institutions' responses to open records requests.

Technical note: Conclusions, if any, drawn from this data are for the reader to decide. Some figures may not appear to pencil out (such as average pay **decreasing** despite a **positive** percent change), but discussion of the deep nuance that leads to this outcome and others is beyond the space available. Send correspondence to perfusionpay@gmail.com to discuss this or other questions further.

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LESSONS LEARNED IN STRATEGIC PLANNING

By William Scott Snider, MHA CCP LP
AmSECT President-Elect

I remember when I first started serving on the Board of Directors for AmSECT. It was the first time I had volunteered as a board director, and I now know I really had very little perspective. Until then, I had thought that the management's executive director at the time, Donna Pendarvis, was just one of the nicest, friendliest volunteer perfusionists I had ever met. Robert's Rules of Order was something that seemed like conjuring medieval spells. After a little while, I understood management and leadership structures better. It probably took me a couple of years to become comfortable with the many acronyms of all the committees that AmSECT hosts, sponsors, collaborates with, directly liaises with, or otherwise communicates with. During my time as Treasurer, followed by an education in healthcare administration, I began to appreciate the true business nature of a not-for-profit organization. However, it wasn't until I chaired my first request for management proposals that I began to understand the pivotal responsibility of volunteer leadership to protect the interests of an organization and ensure its future.

Each of us is so fortunate to reap the benefits of practicing in a field that began as a small group of on-the-job-trained "pump technicians" with an incredible vision of becoming "certified extracorporeal master technologists." So many of the things that we take for granted, such as newsletters and journals, schools, and educational boards, began as ideas that transformed into goals and objectives with champions and leaders and volunteers willing to invest their time in plans that often continue to evolve long after they are initiated. Understanding our history is an essential part of contributing to our future.

All of those ideas and goals of the past are captured at one point or another in strategic plans for tomorrow. AmSECT leadership has, for many years, followed a bylaw requirement to create a new, formal strategic plan every two years with the turnover of executive officers. The President-Elect is granted the privilege of selecting a committee of volunteers to plan, discuss, and formulate the strategic plan for the next two years. Before this group met, committee chairs were asked to consider questions relevant to their own missions and goals, which might be included in a general membership survey. The survey was then created and vetted by the Board of Directors, with expenses approved to provide incentives, including complimentary memberships and conference registrations. As a follow-up, committee chairs were then asked to provide updates on current committee goals and actions and suggestions for future goals they might wish to have formally addressed in the upcoming society plan. Zone Directors and Officers were presented with a different, standardized survey, which has been repeated many times and serves to measure the sentiment of the board over the years.

Members of our Strategic Planning Committee, composed of Officers, Directors, and leaders of the ICEBP, Quality, and Safety Committees, were presented with reference materials that reviewed the different types of popular planning methods and the unique characteristics of strategic planning in not-for-profits. While there exists a variety of strategic planning models with colorful names, such as the 7S model, the Hoshin

THE MOST SUCCESSFUL PATH FOR THE WORKFORCE AS A WHOLE LIES IN COLLABORATION, WHERE A NON-ZERO-SUM GAME FOCUSES LESS ON "MY INTERESTS" AND "THEIR INTERESTS" THAN ON MUTUAL STRATEGIES WHERE EVERYONE WINS.

Kanri framework, and the Blue Ocean strategy, almost all of them are similar in the concept that one or more targets are first identified, followed by the creation of associated goals and objectives. What often changes are the types of targets selected, whether they be strengths to exploit or weaknesses to correct.

In a separate communication, committee members were provided with a copy of every 2-year strategic plan from 2006 to 2022, as well as a compiled, 18-year list of strategic objectives organized by type (new service, existing service, operational, support, evaluation, collaboration, strategy, governance, membership, and financial) and status of completion (completed, not completed, and completed but no longer relevant). We discussed how AmSECT's models for strategic planning have changed over time (with the introduction of goals and objectives, followed by surveys, then SWOT analysis, detailed deadlines, and metrics), the observation that many good ideas have been left uncompleted with less than half of objectives reaching completion, as well as common reasons that goals may not be achieved. Vague, poorly defined objectives have less chance of success than specific and detailed ones. Goals left unassigned, either to a committee or a champion, often never launch. Even successful goals, which meet their targets, can be lost over time if a new process or standard isn't properly recorded in a manner that will survive the regular turnover of leadership that is part of volunteer service.

Before meeting, committee members were also supplied with the outcome of the earlier Board survey and a PowerPoint presentation of charted membership survey results. After brief introductions when our committee met in person at the former site of management headquarters in Chicago, Illinois, we began our all-day meeting with an overview of strategic planning tools and principles, including SWOT analysis, IHI Model for Improvement goal attributes (specific, measurable, how good, by when, for whom) and STEEEP descriptors (safe, timely, effective, efficient, equitable, patient-centered), PDSA and rapid-cycle testing. Utilizing the insight of our committee members, who were also very active AmSECT volunteers, we took turns reviewing AmSECT's many committees and committee missions and the status of current committee projects and goals.

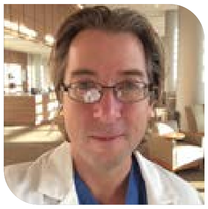
Our Treasurer offered a summary of financial status with implications for future investments. Then, following the recommendations of popular strategic planning, we analyzed environmental influences using PEST analysis and Porter's Competitive Forces. Technological factors play a large role in professional societies' current success or failure. As technology evolves, it is essential for societies to update and improve distribution and communication pathways that are in alignment with the preferences of their members. Both younger and older generations tend to prefer shorter,

summarized information made available on electronic devices. That distribution of information needs to meet the needs of sponsors while providing unpaid services to extend the mission of "professional needs" and paid services to spread financial risk. Competition for information services matches the pace of technology as multiple providers search for new ways to provide online and in-person education that can offer more to consumers than free services, which continue to grow exponentially.

The field of American cardiovascular perfusion is small and specialized, with two national societies, some state societies, and a collection of for-profit organizations. Blue Sea Strategy suggests that the most successful path for the workforce as a whole lies in collaboration, where a non-zero-sum game focuses less on "my interests" and "their interests" than on mutual strategies where everyone wins. Doing that requires understanding our mission, their missions, the strengths and weaknesses of both, and the opportunities for differentiated products that exist in a blue ocean of new market space. The more unique services that AmSECT provides (such as government monitoring, standards, and professional tools) are subject to little or no competition at all. While limited-service entities may vie for the same members, competition from a new full-service entrant is unlikely, given low-income margins and the high fixed expenses of management.

After reviewing both our current and historical strategic plans, focusing on which uncompleted objectives should be kept, we finished with a presentation of the survey results from the general membership and the Board of Directors. What followed were two separate breakout sessions. Participants, organized into three groups, gathered lists of society strengths, weaknesses, opportunities, and threats, which were written on notepads and shared at the end. Groups then split up again to create lists of objectives, written on post-it notes, using all of the information that had been processed up until that point. For the remainder of our meeting, post-it note objectives were paired with SWOT categories, revealing which objectives could address which strengths, weaknesses, opportunities, and threats. Finally, a master list of categorized objectives was created, and each objective was assessed by ease of completion: selected objectives that were continuations of existing objectives, new objectives that were "shovel-ready" or prepared for implementation, and new objectives that required further development. While the committee did an incredible job of staying on task, by the end of the day, it became clear that this could easily be a two-day process. Over the course of the next three weeks, the committee continued to correspond by email as common goals were identified to categorize our objectives, deadlines were set, and champions were assigned. Each committee or individual assigned to an objective was sent a list of their objectives to complete and asked if they had any concerns. When it was verified that no concerns existed, the draft plan was sent to the membership for review and comment. The last step of our process was the Board of Directors' final review and vote.

The 2024-26 AmSECT Strategic Plan can be viewed at https://www.amsect.org/Portals/0/Docs/2024-26%20Strategic%20Plan.pdf?ver=xCcV4Qn8X3QDiUV7Yjph4w%3D%3D. Strategic planning represents a very valuable opportunity for an organization's leadership to review their historical progress, assess the current status of the environment, and envision a path for future success. The outcome of strategic planning can be most effective when it is designed as one component of a structured quality management process.



William Scott Snider, MHA CCP LP
AmSECT President-Elect

STRATEGIC PLANNING REPRESENTS A VERY VALUABLE OPPORTUNITY FOR AN ORGANIZATION'S LEADERSHIP TO REVIEW THEIR HISTORICAL PROGRESS, ASSESS THE CURRENT STATUS OF THE ENVIRONMENT, AND ENVISION A PATH FOR FUTURE SUCCESS.

PROPER ROLLER PUMP OCCLUSION
ENHANCING PATIENT SAFETY AND HEMOLYSIS REDUCTION

Seiler Purdy, BS BS CCP

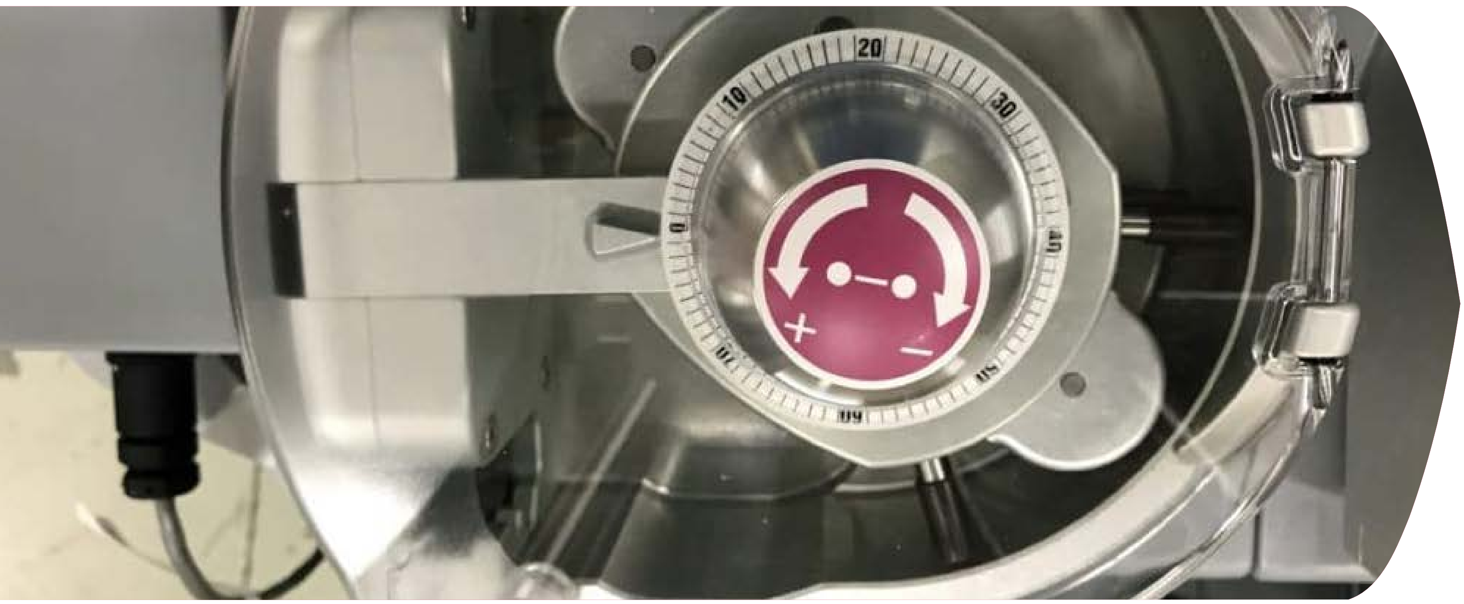


Image Source: https://perfusion.com/development-and-accuracy-evaluation-of-a-degree-of-occlusion-visualization-system-for-roller-pumps-used-in-cardiopulmonary-bypass/

Roller pump occlusion, specifically pump boot occlusion, is one of the most arbitrary and varied perfusion practices. Proper occlusion relies on the precise positional control of the roller pumps to ensure optimal fluid dynamics and patient safety. In older research, two distinct approaches have been explored in the quest to refine perfusion techniques: static occlusion setting methods focusing on fluid drop rate and pressure drop rate. Both methods are designed to reduce hemolysis while preventing retrograde flow. These results suggest that the static pressure drop rate method may be comparable, if not more sensitive and reliable, than the fluid drop rate method of setting the occlusion. This editorial delves into these techniques, highlighting their implications and the need for optimizing pump boot occlusion and patient outcomes.

Galletti and Brecher (1962) described the technique of setting roller pump occlusion by observing the drop of a liquid column. They recommended a just-occlusive setting or a zero fluid drop rate. Some studies done around that time found that nonocclusive settings may be preferable in minimizing hemolysis, and newer studies have confirmed this. Many perfusionists now use a 1 cm/min fluid drop rate with a 1 m column of fluid above the pump boot. This method is not very practical, and those of us who change pump boot sizes frequently often use the fluid drop method as a “gross occlusion” when we first prime the pump boot and then use the pressure drop method after the entire pump has been primed and is ready for bypass. However, this pressure drop method is still a static procedure and is prone to the same errors as the fluid drop method. A prescribed rate of pressure decline does not correspond to the same occlusion setting if the compliance of the circuit changes, as with perfusate temperature, for example. Even with the double roller heads and mini roller heads, it is rare to find both roller heads to have the same occlusion setting. We often need to find the mean or "happy medium" between each roller in the pump head. This difference between the roller heads can be significant in some instances, which can be very dangerous.

Sorin has a non-binding recommendation for setting roller pump occlusion on the S5 pump via pressure measurement. The IFU for the S5 says to occlude the tubing completely using the thumbwheel. Then, turn the pump head by hand (in the normal direction of rotation) until the pressure measuring device indicates a pressure of 200 mmHg. Then, adjust the occlusion with the thumbwheel so the pressure drops from 200 mmHg to 100 mmHg within 1 minute. Roller pump manufacturers do not distinguish between tubing sizes when recommending a fluid drop rate. However, the drop rate becomes equivalent to a flow rate only when multiplied by the internal volume of the tubing. The cross-sectional area of the tubing is at the point of roller compression. Thus, if the same drop rate is achieved, tubes of larger diameter will be set less occlusive than tubes of smaller diameter. The gap must be wider for a larger volume to drop at the same rate as tubing with a smaller volume. This may be the reason for lower hemolysis readings with larger diameter tubing.

In their IFU for the S5 pump, Sorin recommends adjusting the occlusion via a water column. This method requires approximately 3 meters of tubing (the same tubing material as the tubing intended for use with this pump), a bucket of water, and a clock with a second hand. Again, use the thumbwheel to occlude the tubing in the raceway almost completely. Close the pump cover. Use the pump flow adjustment knob to start the pump. Start at a slow speed to fill the tubing. Once the tubing is filled, stop the pump. Remove the output end of the tubing from the bucket and hold it 75 cm above the pump head level. Finally, adjust the occlusion so that the water level drops at the rate of approximately 2.5 cm per minute. Again, this method is not very practical for perfusionists who frequently change the tubing size of their pump head.

Comparing static occlusion setting methods, specifically fluid drop rate, provides valuable insights into the nuanced considerations required for effective pump boot occlusion settings. By examining differing variables such as tubing durometer and tubing internal diameter, researchers could identify the optimal balance that minimizes complications such as hemolysis, tubing spallation, and tubing rupture while maintaining efficient fluid delivery.

Results of past studies underscore the importance of tailoring occlusion settings to the specific requirements of each tubing size and durometer. The findings suggest that a fine-tuned approach to occlusion setting, accounting for both fluid drop rate and pressure drop, can significantly enhance precision and safety. These techniques not only aim to reduce hemolysis but also strive to eliminate retrograde flow, a factor that has been historically challenging to anticipate.

The pressure drop method seems to be our most practical and useful option. Mitigating hemolysis while predicting and preventing retrograde flow is immensely important in maintaining patient safety and decreasing pump head spallation and rupture. The broader implication for perfusion practices is that the synergy between static occlusion setting methods and static pressure drop methods offers a comprehensive framework for optimizing roller pump performance.

A standardized protocol could improve perfusion safety guidelines, enable perfusionists to tailor their approaches based on patient size and procedural requirements, and ultimately enhance patient outcomes. The goal is to improve the efficiency of roller pumps and minimize adverse effects such as hemolysis, retrograde flow, tubing spallation, and pump boot rupture.

Newer pump control systems continue to create differing perfusion techniques. The landscape of perfusion pump management is evolving, and the precision, safety, and overall effectiveness of roller pump occlusion procedures must be refined. By refining static occlusion setting methods and using nonocclusive strategies, the perfusion community can continue to do what has worked for us in the past. The future promises even more personalized, safe, and patient-centric approaches to perfusion.

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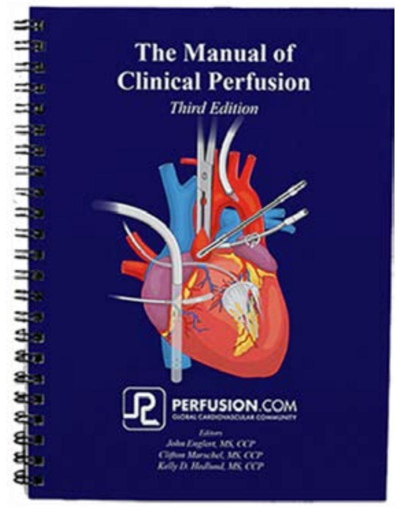
THE MANUAL OF CLINICAL PERFUSION 3RD EDITION

Englert J, Marschel C, Hedlund KD (eds). Charleston: Palmetto Publishing, 2023. 448 pp. Ill. $129.99.

Reviewed by Dennis P. Coyne, BS CCP



The Manual of Clinical Perfusion has been a favorite resource for perfusionists for three decades. Old-timers like me will remember the first edition as a 200-page pocket guide featuring a white cover and spiral binding. An interim version, just 30 pages longer with nominal updating, was released in 2004. This third edition, burgeoning to over 400 pages, represents an extensive and much-needed update. Throughout my years in clinical perfusion practice, I have guest lectured to ICU nurses, CRNA students, and Anesthesia Residents on Cardiopulmonary Bypass and other related Perfusion Scope of Practice areas. Each profession had its "bible" or "go-to" manuscript as a resource guide. This 3rd Edition of *The Manual of Clinical Perfusion* is the most recent resource for our profession.

The first two chapters discussing cardiovascular anatomy and diagnostics (e.g., EKG, coronary angiography) remain largely the same. Additions to the third chapter dealing with blood include a diagram of the ever-familiar clotting cascade and a snippet about direct thrombin inhibitors. Likewise, newly added figures depicting the oxygen dissociation curve, the effects of temperature on blood gas values, and sieving coefficients contribute significantly to the fourth, fifth, and sixth chapters. Where pertinent, readers will note that perfusion-related standards (denoted in italics) have been added to supplement the text. Topic-specific references are bountiful, and QR codes complement eight chapters, which take the reader to the perfusion.com website for additional information. The discussion on myocardial protection is unchanged except for brief statements about Del Nido formulation and microplegia.

The book rightly examines new technology, such as the Organ Care System by TransMedics, for normothermic machine perfusion of donor organs. Also included as fresh material are HIPEC, the Angio Vac system, and platelet gel. There are some minor proofreading errors. For example, the illustrations on pages 6 and 17 appear mislabeled. Moreover, the specification table for arterial line filters on page 324 is outdated, which is uncharacteristic for the whole of this manual. The omission of classic perfusion accident articles as references to Chapter 10 was a disappointment (Stoney 1980; Kurusz 1986; Mejak 2000; Stammers 2001; Grist 2021).

Skillfully, this manuscript delivers on its purpose — as a resourceful pump-side tool for the working perfusionist and a wonderful resource for our non-perfusion colleagues. In the interest of full disclosure, John Englert and Kelly Hedlund are friends of mine, and I received my copy as a retirement gift. Thanks and congratulations to John, Clifton, and Kelly for the tremendous work and dedication put into updating the manual.

Dennis P. Coyne, BS CCP Wichita, Kansas. I am not a professional book reviewer but have been ABCP Certified since 1984. I retired in September 2023 and have served as staff perfusionist, clinical coordinator, department manager, and department director throughout my 41-year career.

THE BUBBLE OXYGENATOR FONDLY REMEMBERED

Bob Groom, MS CCP

Arguably, the greatest oxygenator of all time was the DeWall-Lillehei bubble oxygenator. In 1954, 31-year-old Dr. Richard DeWall was tasked by Dr. C. Walton Lillehei to develop a mechanical replacement of the parent donor used during cross-circulation open-heart procedures. Dr. Lillehei instructed Dr. DeWall not to waste time surveying the research literature on blood oxygenation but to focus his effort in the laboratory. Lillehei also advised him to avoid direct contact oxygenation of the blood with bubbles because the results had been abysmal.

During the day, DeWall managed cross-circulation support during open-heart operations. But in the afternoons and evenings, he could be found building a blood oxygenator and pump system in the research lab. His brainchild turned out to be a helical labyrinth of tubing situated on a stretcher held together by numerous three-fingered laboratory clamps and wires. The heap of tubes and various parts could be acquired for about $15 from companies that supplied tubing to beverage distributors.

To everyone's surprise, his bubble oxygenator proved extremely efficient in both oxygenating blood and removing carbon dioxide. The gas exchange surface using this direct method was enormous. Oxygen was bubbled directly into the blood through a gas sparger comprised of 18 22-gauge needles. After sufficient testing in the lab, it was first used on a three-year-old patient on May 13, 1955, during the open repair for closure of a ventricular septal defect. By 1957, the DeWall bubble oxygenator had been successfully used on over 200 patients, the world's largest series of direct vision open-heart surgery.

The helical reservoir bubble oxygenator, invented by Richard DeWall (pictured) and C. Walton Lillehei, made open-heart surgery a practical procedure. Courtesy University Archives. Minnesota Research Firsts in Medical Devices, Procedures, Health Care, and Bioscience. https://mbbnet.ahc.umn.edu/firsts/historic.html, accessed Jan. 16, 2024

Lillehei's research team, led by Dr. Vincent Gott, refined the blood path further to reduce blood trauma, make the gas exchange more predictable, and reduce the priming volume. Furthermore, they wanted to make it capable of being replicated commercially, thus making it affordable and available to other cardiac teams for widespread use. The result was the first commercially available extracorporeal oxygenator. The oxygenator's blood path and components were encapsulated within bonded polyvinyl chloride sheets. It was subsequently manufactured by the Artificial

University of Minnesota's bubble oxygenator cost $15 and was easy to use. Richard DeWall is shown here with his model in 1955. University of Minnesota, Atlas of Human Cardiac Anatomy, https://www.vhlab.umn.edu/atlas/umn-cv-history/1951-56.shtml, accessed Jan. 16, 2024.

Richard DeWall and Vincent Gott standing beside a Travenol disposable bubble oxygenator. Evolution of Cardiopulmonary Bypass, William S. Stoney, 2 Jun 2009, https://doi.org/10.1161/CIRCULATIONAHA.108.830174, Circulation. 2009;119:2844–2853, accessed Jan. 16, 2024.

Organs Division of Travenol Laboratories in Morton Grove, Illinois, and was commercially available until the mid-1980s.

Before the introduction of Travenol bubble oxygenators, film-type oxygenators were made of glass and polished stainless steel. They were comprised of hundreds of parts that required careful cleaning, assembly, and sterilization. The users of these devices were true artisans, devoting hours of careful inspection, cleaning, sterilization, and assembly to make the reusable oxygenator available for the next case. Dr. DeWall's oxygenator and its subsequent refinement and mass production by Travenol Laboratories was a gateway that expanded the availability of cardiopulmonary bypass exponentially. This was a classic example of how enabling technologies can bring about a radical change in the capabilities of a user or a culture.

This author used the Travenol 6LF on his first 20 cases as a student at Texas Heart Institute in 1980, an experience he will never forget. The soft, flexible oxygenator was tied to a metal frame using pieces of IV tubing. The priming volume of the circuit was nearly two liters. Oxygenation and carbon dioxide removal were controlled by increasing the gas flow and inflating a shim that could adjust the diameter of the oxygenation column. A faint rushing sound could be heard as the oxygen sparger released gas into the blood in the oxygenation column. The sight of rivulets of bright red blood cascading over the defoaming sponges was mesmerizing and always reassuring.

In time, injection molding of hard-shell polycarbonate bubble oxygenators and the subsequent introduction of silicone sheet and microporous polypropylene oxygenators became ubiquitous for routine CPB. Early studies comparing membrane to bubble oxygenators found only small differences in plasma-free hemoglobin and post-procedure platelet count when used for less than two hours. Later, more contemporary measures of inflammation and coagulation revealed tangible differences. By 1989, only 5% of the pediatric centers in North America were still using bubble oxygenators.

While today's oxygenators and circuitry are much more precisely constructed and biocompatible, we must not forget that the bubble oxygenator, for a season, was instrumental in making open-heart surgery plausible and replicable all over the globe. Countless patients benefited from the diaspora of this technology in the early years.

In 2007, Dr. DeWall wrote a short article on the development of the DeWall-Lillehei oxygenator. His memoir begins with a passage from the Scriptures:

> "To everything, there is a season and a time for every purpose under heaven."
>
> Ecclesiastes 3:1

I stand in awe of the history of our field and the stories and lessons from trailblazers and giants like Dr. C. Walton Lillehei and his team. There are avenues to make CPB less invasive that have yet to be discovered or implemented. May we embrace the technology available today and strive to be diligent in improving our work to bring about the greatest good for patients with heart disease.

> *"There is nothing better for a man (a person) than to eat and to drink and to find joy in his work. This too, I saw, is from God's hand."*
>
> ESV. Ecclesiastes 2:24

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Bob Groom, MS CCP

SELF QUIZ Q1 2024, PART 1

By Shannon Barletti, BSN RN CCRN CCP

1. Which of the following is the principal receptor for von Willebrand factor (vWF)?
   - **a.** Thromboxane A2
   - **b.** Platelet glycoprotein complex I (GP-Ib)
   - **c.** Prostacyclin
   - **d.** Thrombospondin

2. Activated platelets produce ___________, which provides stimulus for further platelet aggregation.
   - **a.** Platelet glycoprotein complex I (GP-Ib)
   - **b.** Prostacyclin
   - **c.** Thrombospondin
   - **d.** Thromboxane A2

3. ___________ catalyzes the conversion of fibrinogen to fibrin.
   - **a.** Thrombospondin
   - **b.** Thromboxane A2
   - **c.** Calcium
   - **d.** Thrombin

4. True or False. A defining characteristic of primary hemostasis is the conversion of fibrinogen to fibrin and stabilization of the platelet plug.
   - **a.** True **b.** False

5. What local mediator acts to localize platelet aggregation, prevent extension of the clot, and maintain vessel lumen patency by inhibiting platelet aggregation?
   - **a.** Thrombospondin
   - **b.** Thromboxane A2
   - **c.** Prostacyclin
   - **d.** Prothrombin

6. Which of the following factors are Vitamin K dependent? (Select all that apply)
   - **a.** Factor I
   - **b.** Factor II
   - **c.** Factor V
   - **d.** Factor VII
   - **e.** Factor VIII
   - **f.** Factor IX
   - **g.** Factor X
   - **h.** Factor XIIII

7. ___________ is polypeptide produced by endothelial cells that acts as a natural inhibitor of the extrinsic pathway.

8. Using the word bank below, replace the bold letters below to fill in the table:

Factor Number	Clotting Factor Name	Function
I	**A**	Clot formation
II	Prothrombin	Activation of I, V, VII, E, XI, XIII, protein C, platelets
III	**B**	Co factor of VIIa
IV	Calcium	Facilitates coagulation factor binding to phospholipids
V	Proaccelerin, labile factor	Co-factor of **F**
VII	Stable factor, proconvertin	Activates factors **G, H**
VIII	Antihaemophilic factor A	Co-factor of IX-tenase complex
IX	**C**	Activates X, Forms tenase complex with factor VIII
X	**D**	Prothrombinase complex with factor V, Activates factor II

Stuart-Prower factor	Factor IX	Factor X
Tissue Factor (TF)	Factor VIII	Fibrinogen
Antihaemophilic factor B or Christmas factor	X-prothrombinase complex	

References:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4260295/

Shannon Barletti, *BSN RN CCRN CCP*

1. B **2.** D **3.** D **4.** FALSE, SECONDARY HEMOSTASIS **5.** C **6.** B, D, F, G **7.** TISSUE FACTOR PLASMINOGEN INHIBITOR. **8.** A: FIBRINOGEN, B: TISSUE FACTOR (TF), C: ANTIHAEMOPHILIC FACTOR B OR CHRISTMAS FACTOR, D: STUART-PROWER FACTOR, E: FACTOR VIII, F: X-PROTHROMBINASE COMPLEX, G, H: FACTOR IX, FACTOR X

SELF QUIZ Q1 2024, PART 2

By Michelle Jaskula-Dybka, MS CCP

1. According to Kapoor (2014), what is the most common etiology of heart disease in pregnant women, accounting for nearly 60% of cases?

- **a.** Rheumatic mitral valve disease
- **b.** Coronary artery disease
- **c.** Hypertension
- **d.** Atherosclerosis

Source: https://journals.lww.com/aoca/Fulltext/2014/17010/Cardiopulmonary_bypass_in_pregnancy.6.aspx

2. According to the Mayo Clinic surgical database review, what were the neonatal complications associated with cardiothoracic surgery in pregnant patients?

- **a.** Premature deliveries
- **b.** Fetal deaths
- **c.** Intrauterine growth retardation
- **d.** Respiratory distress syndrome
- **e.** Developmental delay
- **f.** All of the above

Source: https://journals.lww.com/aoca/Fulltext/2014/17010/Cardiopulmonary_bypass_in_pregnancy.6.aspx

3. A core temperature greater than___________ degrees Celsius is the threshold for defining malignant hyperthermia (MH).

4. Describe the mechanism of malignant hyperthermia.

- **a.** nositol-1,4,5-triphosphate receptors play a crucial role in regulating calcium release from the sarcoplasmic reticulum
- **b.** In individuals with MH susceptibility, the inositol-1,4,5-triphosphate receptor is mutated and becomes hyperactive, leading to uncontrolled and excessive release of calcium ions
- **c.** In the presence of a triggering agent, calcium is continuously released from the sarcoplasmic reticulum in skeletal muscle, leading to continuous muscle contraction, depletion of ATP stores, hypermetabolism, hypercarbia, respiratory acidosis, and heat production.
- **d.** None of the above

5. Name two volatile inhalation anesthetic agents that can trigger MH: ___________ and __________.

6. Describe the structural difference between Hemoglobin-A and Hemoglobin-S in sickle cell disease.

- **a.** Hemoglobin-A consists of 2 alpha and 2 beta chains while Hemoglobin-S has 2 normal alpha chains and 2 mutated beta chains
- **b.** Hemoglobin-A consists of 2 normal alpha chains and 2 mutated beta chains while Hemoglobin-S has 2 normal alpha and 2 normal beta chains
- **c.** Hemoglobin-A consists of 2 mutated alpha and beta chains while Hemoglobin-S has 2 normal alpha and 2 beta chains
- **d.** Hemoglobin-A consists of 2 alpha and 2 mutated beta chains while Hemoglobin-S has 2 normal alpha and 2 beta chains

7. In the context of cardiopulmonary bypass for cardiac surgery in sickle cell patients, what measures should be taken to optimize CPB management and prevent sickling?

- **a.** Maintain high O2 saturation (>85%) and prevent acidosis
- **b.** Maintain normothermia and optimize tissue perfusion with high flows
- **c.** Maintain a high hematocrit and use warm blood crystalloid cardioplegia to flush coronary arteries of Hemoglobin-S followed by cold doses as Hemoglobin-A rises
- **d.** All of the above

8. According to Derzon et al. (2019), in which patient population was the restrictive transfusion strategy found to be effective in reducing RBC transfusions?

- **a.** Intensive and tertiary care for orthopedic and anemic patients
- **b.** Neurological patients
- **c.** Critically ill and cardiac surgical patients
- **d.** A and C

Source: https://academic.oup.com/ajcp/article/152/5/544/5532293

9. What is the recommended range of hemoglobin (Hb) levels for implementing the restrictive transfusion strategy, according to AABB guidelines?

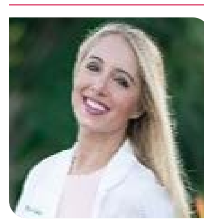
- **a.** 5.5 g/dL
- **b.** 6 g/dL
- **c.** 7-8 g/dL
- **d.** 8.5 g/dL

Source: https://academic.oup.com/ajcp/article/152/5/544/5532293

10. According to Derzon et al. (2019), what percentage of hospital stays that included a procedure involved blood transfusions in the United States?

- **a.** 15%
- **b.** 10%
- **c.** 8%
- **d.** 5%

Source: https://academic.oup.com/ajcp/article/152/5/544/5532293



Michelle Jaskula-Dybka, ***MS CCP***

1. A **2.** F **3.** 42 DEGREES CELSIUS. **4.** C **5.** SEVOFLURANE AND ISOFLURANE **6.** A **7.** D **8.** D **9.** C **10.** B

2024 ELECTION RESULTS

AmSECT is excited to announce the results of our recent Board of Directors and elected committee election. Thank you to all who participated in voting, moving AmSECT forward with a board of dedicated leaders and volunteers.

Please join us in congratulating our winners, who began their terms in March 2024:

President-Elect
Gregory A. Mork, BA LP CCP FPP

Secretary
Kirti Patel, MPS MPH CCP LP FAACP

Treasurer
Renee Axdorff-Dickey, CCP MBA

Zone 1 Director
Ed Harman, MS CCP FPP MB

Zone 2 Director
Douglas Zavadil, MPS CCP FPP

Zone 3 Director
Dorothy Holt, BS CCP FPP

Nominating Committee
Jordan Voss, MPS CCP FPP

Achievement Recognition Committee
Kristie Steffens, CCP FPP

By-Laws Committee
Kassandra Reyes

Ethics Committee
Chet Czaplicka, BSN RN CCP

Join us in Congratulating Our 2024 Winners!

We thank you all for participating in the recognition of your colleagues and congratulate them on this outstanding achievement. The awards will be presented at the 62nd International Conference. Register now to celebrate your peers' accomplishments in-person!

Want to learn more about our AmSECT National Awards? Find more details here.

JOHN H GIBBON AWARD

Joseph Sistino, PhD, CCP, Emeritus
The John H. Gibbon Jr. Award honors an individual who has made significant contribution(s) to the field of extracorporeal circulation.

AmSECT AWARD OF EXCELLENCE

Scott Snider, CCP, LP
The Award of Excellence is presented to a perfusionist who has demonstrated excellent work which exemplifies creativity and intellectual originality in extracorporeal technology. This award is presented for excellence in any area such as education, continuing education, research, publication, or leadership.

AmSECT PERFUSIONIST OF THE YEAR

Gregory Mork, BA, LP, CCP, FPP
The AmSECT Perfusionist of the Year Award is presented to an individual who has demonstrated outstanding commitment to the field of extracorporeal technology during the current year. This award is presented based on a variety of reasons, including excellence in the field of perfusion through noteworthy extracurricular or volunteering activities.

American Board of Cardiovascular Perfusion 2023 Annual Report

Please read on in the ABCP 2023 Annual Report to see the year in review. To ease the reader's eyes, we divided the report into two documents consisting of the Annual Report (reflecting all data related to the past year) and a separate Reference Sheet that gives breakdowns of topics commonly addressed by the CCP community.

Please contact us at info@abcp.org with any questions and comments. Thank you for your dedication to your communities and patients.

CONGRATULATIONS TO OUR **2024 FELLOWS OF PEDIATRIC PERFUSION!**

We are delighted to announce and give congratulations to those who have been awarded the prestigious distinction of Fellow of Pediatric Perfusion (FPP) for 2024.

The Fellow of Pediatric Perfusion is one of the highest distinctions a pediatric perfusionist can achieve from AmSECT. Perfusionists awarded a FPP distinction demonstrate professional and clinical expertise in adult and pediatric congenital heart surgery.

Please join us in celebrating and acknowledging the remarkable achievements of our 2024 Fellows of Pediatric Perfusion. Their contributions to our team and to the field of pediatric perfusion are invaluable, and this honor is truly well-deserved.

Be sure to congratulate them at the upcoming AmSECT 62nd International Conference!

Glen Bell

Landon Busby

David Durdov

Justin Farr

Julie Fenske

Rachel Gambino

Justine Graham

Alison Holt

Jeffrey Hensler

William Medlin

Kassandra Reyes

Matthew Wilder