

Platelet Preservation:
***Do perfusion strategies really
make a difference?***

Gordon R. DeFoe, BA, CCP

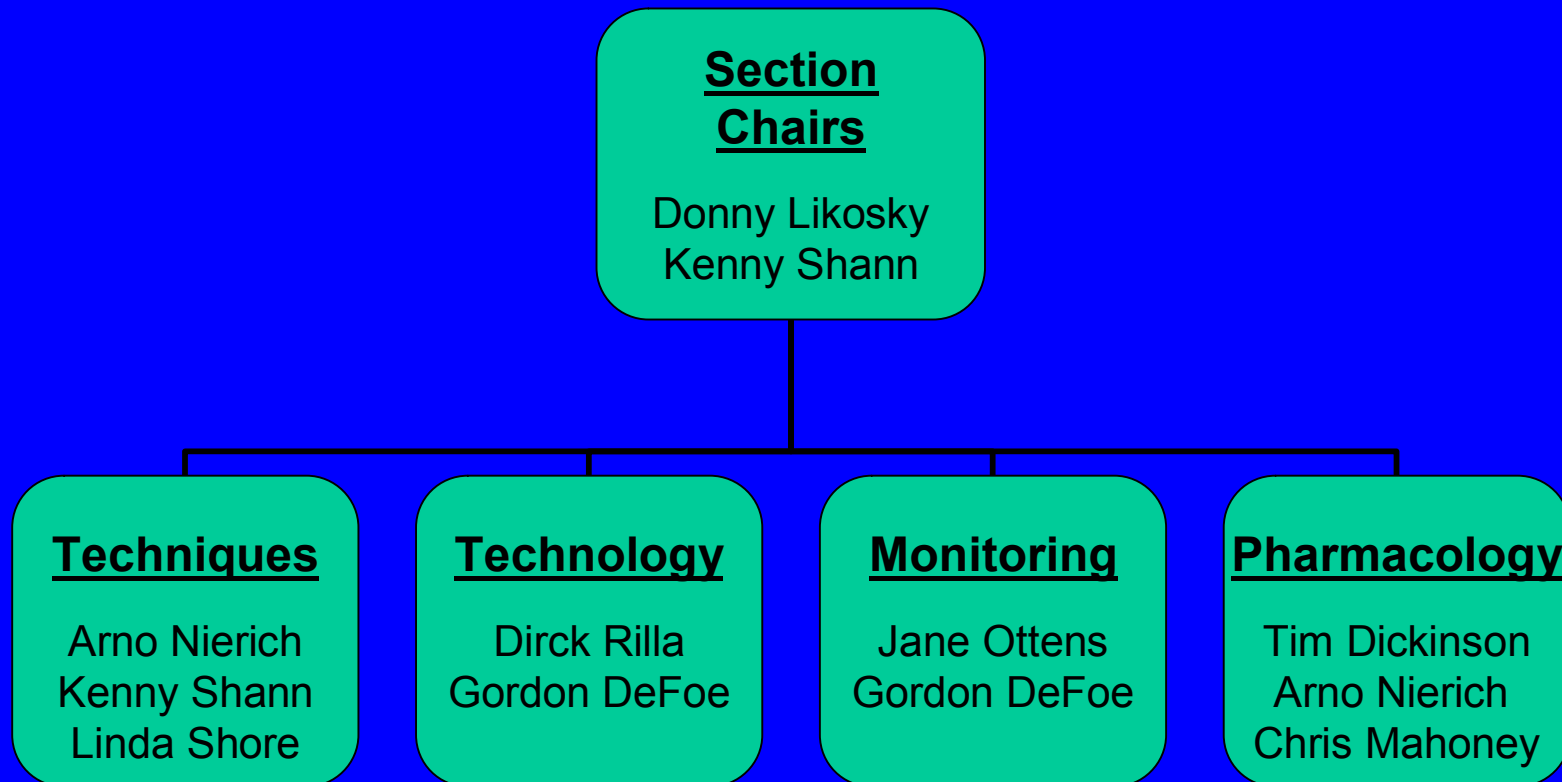
**Dartmouth-Hitchcock Medical Center
Dartmouth Medical School
Lebanon, NH, USA**



International Consortium of Evidence Based Perfusion

- **International group of perfusionists, physicians, researchers and epidemiologists committed to improving the conduct of CPB**
- **Continuation of the work begun with the development of “Guidelines I” (Shann KG et al, J Thorac CardioVasc Surg 2006;132:283-90**
- **Consensus agreement of the group on either**
 - **topics from Shann article needing further exploration**
 - **new topics needing development**

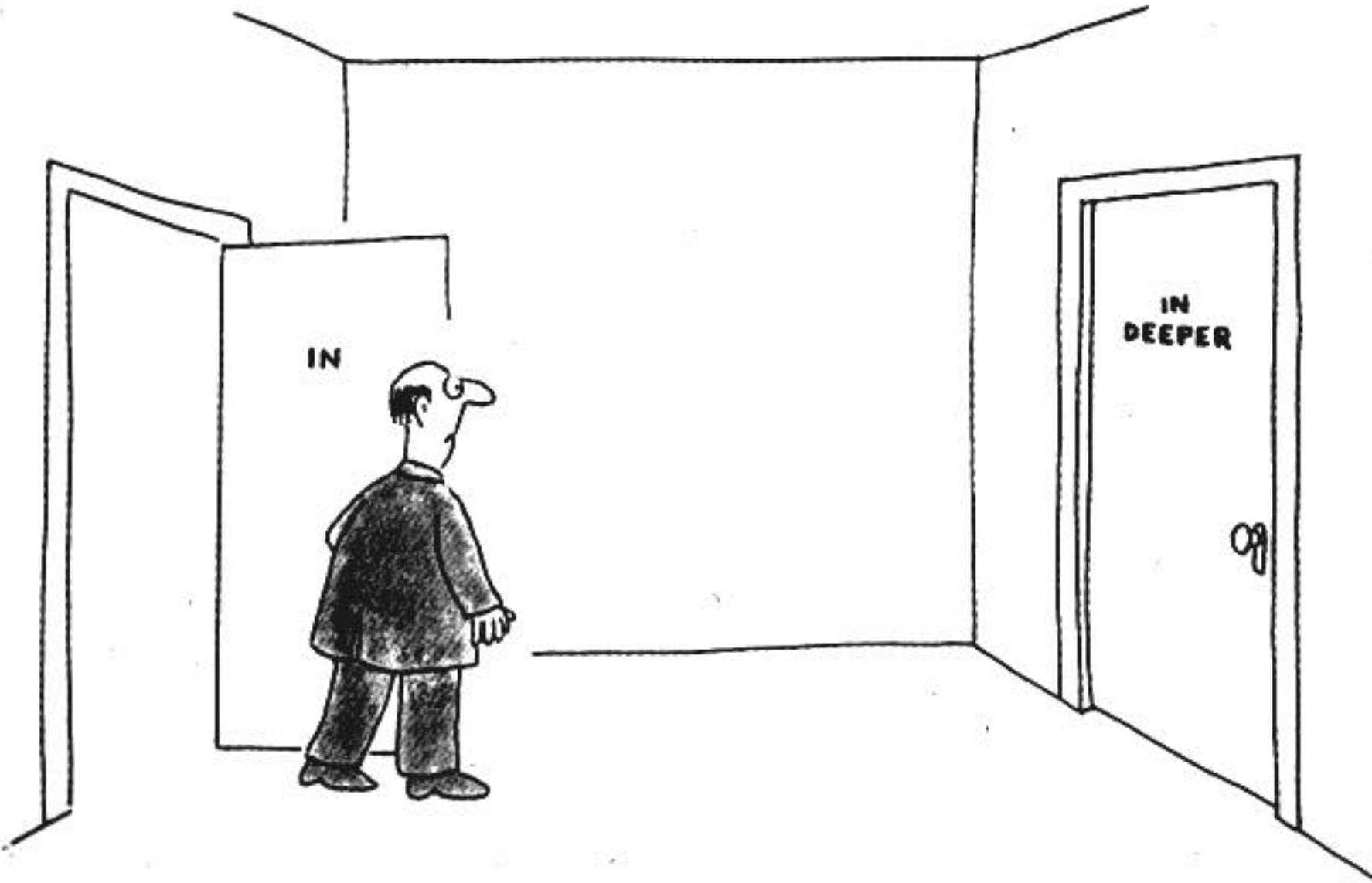
The Platelet Preservation Group



Defining the problem

Statement: We believe that platelets are good.

- Can we physically and qualitatively preserve platelets during cardiopulmonary bypass?
 - Surface coatings or treatments
 - Pump types
 - Circuit components
 - Cell salvage devices
- Are there holes in our knowledge?



What are the steps?

- **Evaluate the peer-reviewed medical literature in a rigorous and consistent fashion**
- **Focus expertise on specific topics**
- **Develop an informed opinion regarding effectiveness and assign levels of evidence**
- **Formulate a “finding” and a written summary for publication**

Search methodology

- **NCBI - National Center For BioTechnology Information - MEDLINE search, ≥1996**
- **Search parameters**
 - **((platelet OR platelets OR flow cytometry) AND (cardiac surgery OR (("cardiopulmonary bypass"[TIAB] NOT Medline[SB]) OR "cardiopulmonary bypass"[MeSH Terms] OR ("coronary artery bypass"[TIAB] NOT Medline[SB]) OR "coronary artery bypass"[MeSH Terms]) OR (valve OR valves OR valvular) AND and surgery))) AND (biocompatible coated materials OR coated circuits)**

Evaluation of search results

- An automated Excel spreadsheet was automatically populated by NCBI search
- NCBI download includes abstract (if available)
- Reviewers can sift through references based upon abstract, or decide to review entire paper
- Almost all citations retrievable on-line
- List can then be sorted by Excel to form an “A list”; details from paper entered into cells; the fate of all citations is tracked.
- This technique was a major improvement over previous efforts for Shann paper and facilitated sharing the work over long distances

Classification of recommendations

- **Class I** - Conditions for which there is evidence, general agreement, or both that a given procedure or treatment is useful and effective
- **Class II** – Procedure or treatment should be performed or administered
- **Class IIa** – Additional studies with focused objectives are needed
- **Class IIb** – Additional studies with broad objectives are needed; additional registry data would be helpful
- **Class III** – Procedure or treatment should not be performed or administered because it is not helpful and might be harmful

Levels of evidence

- **Level A** – Data is derived from multiple randomized clinical trials
- **Level B** – Data is derived from a single randomized trial or non-randomized studies
- **Level C** – Consensus opinion of experts

Results of literature search

- **103 “hits” on MEDLINE**
- **All proved to be retrievable on-line**
- **44 citations (inc. 2 review articles) were judged to be relevant to the topic of “technology for platelet preservation on bypass”**
- **In all, we evaluated studies on 4,234 adult patients in 41 distinct trials**

“Biocompatible” v “Standard”

- **The clear preponderance of the evidence is that coated circuits better preserve platelet counts and reduce platelet deposition and activation, when used in either the “tip-to-tip” or “all but cannula” mode**
- **No clear benefit was observed when only the oxygenator was coated**

Comparison of technologies

- **When different coatings were directly compared, there was no treatment that was clearly better than any other in terms of platelet preservation**
- **We did not find clear evidence that pump types or other component designs affected platelets directly**

Work still to be done

- **Cochran meta-analysis will be run**
- **Write discussion section for next publication**
- **There are holes in our knowledge**
 - **Roller versus centrifugal**
 - **Closed versus open**
 - **Role of pump suction versus IRCR**
 - **Is there a “best coating?”**

Proposed “Finding”

When used in either the “tip to tip” or “all but cannula” configuration, biocompatible cardiopulmonary bypass circuits offer superior preservation and protection of platelets during and after cardiac surgery. (Class I, Level A)

Go



Sox!

Thank you, Baltimore!