

***RAD-AID IR***

***Site Procurement  
Implementation Guide***

***August 2020***



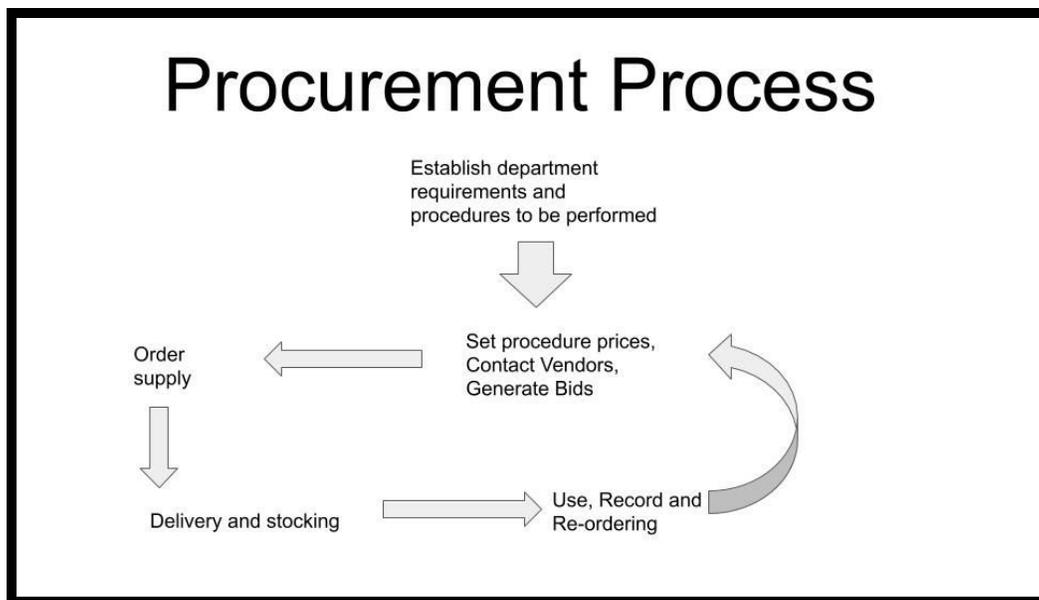
**Introduction:**

The primary objective of establishing a procurement network for a RAD-AID Interventional Radiology site is to have a reliable and sustainable source for obtaining disposable equipment and products used for patient care. Disposables can be acquired in many different ways, the sources of which change naturally over time as a new site becomes more established. Additionally, there are unique challenges related to keeping disposable equipment well organized both for its efficient use as well as for effective and timely re-acquisition to replenish used product. This document aims to provide a step-by-step primer on how to establish, organize and grow an effective procurement network at a RAD-AID IR site.

**Procurement Process:**

When a RAD-AID IR site is being established, the primary initial source of disposable equipment usually consists of donated supplies. These supplies are typically brought into the country by outside volunteer teams. These donations can come from individual hospitals and health care systems, non-profit organizations or commercial vendors as a result of charitable grants. As a site’s supply chain logistics mature, the goal is to develop more long-term relationships with local vendors and regional industry partners to establish sustainable supply chain practices.

The standard procurement process workflow (illustrated in *Figure 1* below) begins with establishing departmental approval and agreement on the interventional procedures to be performed. With this list of expected procedures (and numbers of those procedures expected to be performed if available), an IR site can start generating accurate estimates of the types of supplies needed and cost that they will incur. This process, termed the *Definition of Need*, is further illustrated in its own section later in this document.



*Figure 1: The Procurement Process*

Once there is data available to better define disposable equipment needs, IR sites can then begin conversations with both sources of donation and vendors to work toward meeting their supply needs. The ultimate goal is to transition completely to vendor relationships as this both creates a more sustainable supply chain and also helps to develop the local and regional IR economy to incentivize more vendor involvement. IR sites should contact vendors directly to generate bids on equipment supply. Once equipment is ordered, a reliable method of delivery and equipment stocking needs to be in place. This is particularly critical as the method of equipment stocking and accounting will directly affect a department’s ability to re-order

necessary supplies in a timely fashion so as not to delay patient care. Several of these steps will be further discussed in their respective sections below.

Above all, it is important to keep in mind that a well-planned and well executed procurement process is the life blood of any success IR department!

## **Stock & Supply Chain Logistics FAQ**

In order to establish a successful procurement network at a RAD-AID IR site, the involved partners and stakeholders need to have a clear understanding and definition of the component parts. Below is a guide to understanding the important building blocks of IR disposable stock and supply chain logistics.

### **What is stock?**

Interventional stock refers to the supply of interventional devices such as catheters and wires available in your Interventional Suite. You ideally want a steady stock of these materials so that you do not run out prior to a planned procedure.

### **What is a combine?**

It is an indicator that a portion of your stock is running low. This can be a card placed at the second to last item in each category that reminds you to reorder those items.

### **Who is responsible for stock levels and re-ordering?**

A designated person or team should be responsible for stock level monitoring and re-ordering which should be part of regular duties. This could include nursing/technologists or administrative personnel. Systems might include writing the items used during a procedure to enable reordering, monitoring of combine cards and/or regular stock audits.

### **How do we keep track of stock levels?**

Paper, computer or web based tracking should be performed on a weekly, monthly, or semi-annual basis. After each procedure, the device and consumables used should be noted. These logs should be updated after each case or at the end of the day if labels/packaging is kept. This log will help inform future ordering and current use in the department.

### **How do we fund new stock?**

A budget should be set by the department for IR supplies. This can increase as new service lines become viable. Basic catheters, wires and access needles should be supplied via vendors, third party suppliers or central supply within the hospital. Alternatively donated stock could be used in the short term where preliminary charges are made to patients with means to pay and used to fund new stock purchases.

A master charge sheet should be developed that outlines total cost for a procedure including consumables that can be purchased by the patients prior to the procedure in order to secure

payment. Using these payments new supplies can be ordered. Donated stock needs to be re-sterilized in hospital or “gassed” prior to use when feasible.

### **Where do I put our stock?**

Stock should be placed in a separate room that can be designated for the IR suite or within the suite itself in organized shelving. Additional high volume items can be kept in the room and angio packs should be available in the room.

### **What is required for each case?**

For most cases, a biopsy tray or angio pack will be required. This tray or pack contains the necessary items to create a sterile field, start the procedure and close. In addition the catheters, wires, needles and other devices used for each case can be laid out onto the sterile table after these trays or packs have been opened.

### **Who is involved in creating a stock, supply chain and procurement process?**

This involves the department, the interventionalists, the lead technologists, the lead nurses and the administrators.

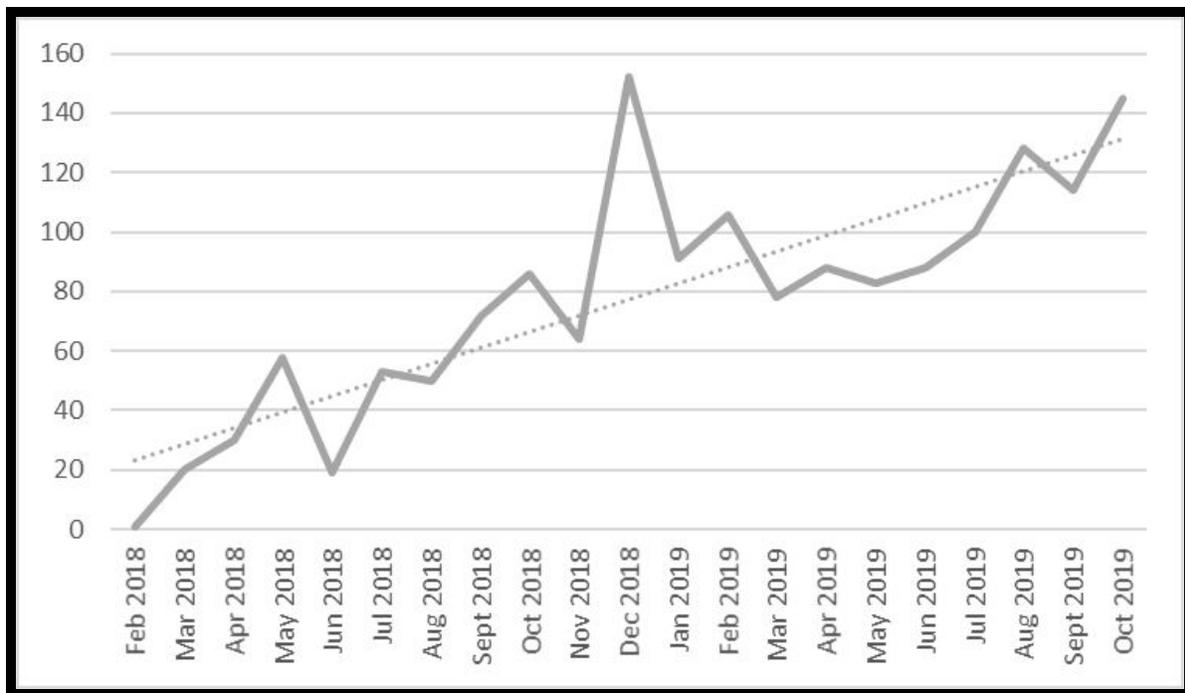
### **How do we start this process?**

Keep a log of the donated consumables used so this can guide purchasing in the future. Seek out the surgical department and cardiology department leads to see what vendors they have been working with. See if you can order directly from the vendor list that has regional distribution at your site. Import materials and devices for use from neighboring countries that may serve a similar purpose to the listed items. Continue to order a set amount of necessary items and larger bulk orders of biopsy trays and angio packs. Send out item lists and bids to vendors and contract with those that have the best options for your site.

**Definition of Need:**

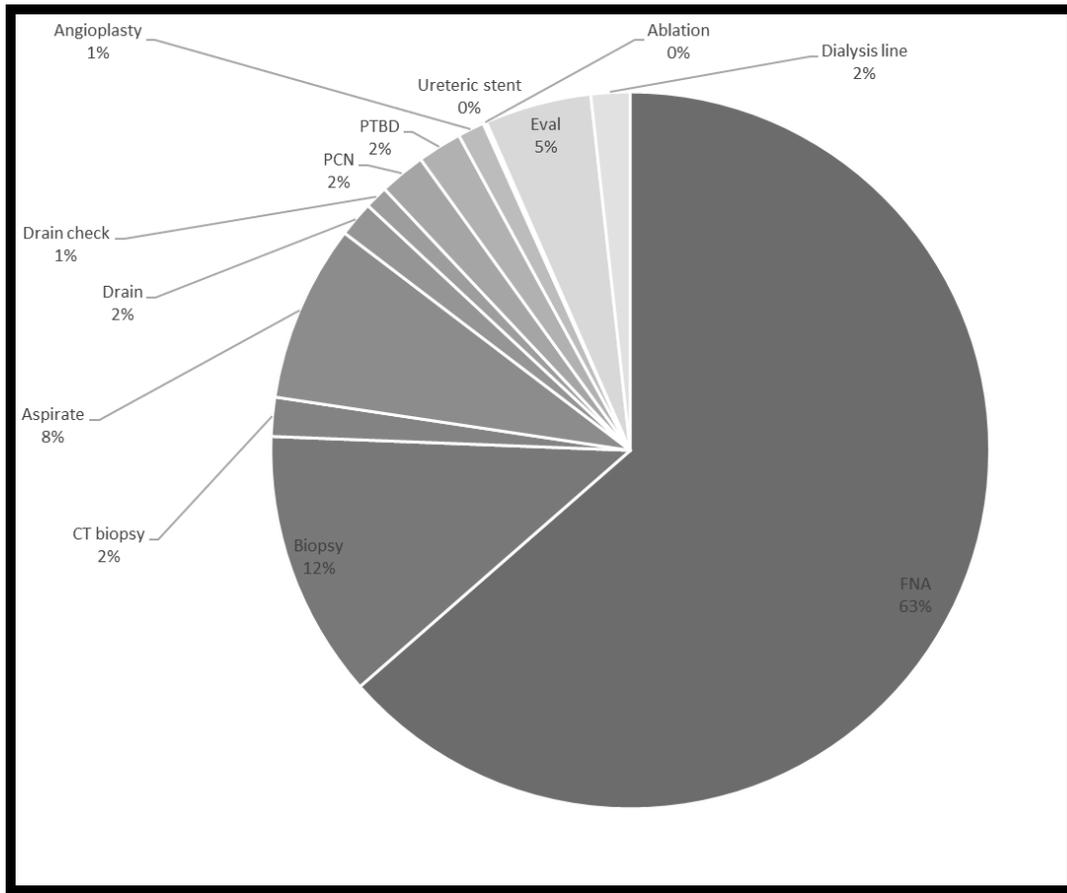
A key step in setting up a procurement supply chain is accurately defining the needs of your IR department. If IR is already being performed at your RAD-AID site, this data can be gathered retrospectively. If not, you can plan to prospectively gather the data moving forward in order to more accurately predict your disposable supply requirements.

In order to illustrate how this data can be acquired and accurately utilized to predict product usage, we will look at an example case study involving a RAD-AID IR site in Africa. Data from every IR procedure performed in the department -- including date, patient name and age, medical record number, and procedural details -- were tracked on a paper ledger by nursing staff from February 2018 to October 2019 (see *Figure 2* below).



*Figure 2: Number of IR procedures per month, St. Paul's Hospital*

Detailed analysis of the data revealed that 1,251 procedures had been performed during the given timeframe, of which the largest number of procedures were 795 fine needle aspirations (63%), 173 biopsies (14%), and 84 drainages (7%). A more detailed breakdown of the procedure mix by percentage is seen in *Figure 3* below:



*Figure 3: Procedural mix by percentage*

This detailed accounting allowed accurate retrospective prediction of equipment utilization in the department during the course of the data collection (see *Figure 4* below). This data allows more accurate prediction of future departmental disposable equipment needs and provides a framework to guide purchasing decisions during implementation of a supply chain procurement network.

Procedure	Number	Standard needle	Chiba needle	Biopsy needle	Coaxial biopsy set	Micro-puncture set	Trocar needle	Standard guidewire	Hydrophilic guidewire	Dilator	Standard drainage catheter	Internal / external biliary drainage catheter	Sheath	Catheter	Dialysis line set
FNA (superficial)	664	1													
FNA (deep)	131		1												
BIOPSY (non-coaxial)	74			1											
BIOPSY (coaxial)	112				1										
ASPIRATION (superficial)	84	1													
ASPIRATION (deep)	16						1								
DRAINAGE	33						1	1			1				
PCN	26						1	1		1	1				
PTBD	25				1		1	1			1		1	1	
DIALYSIS LINE insertion	22														1
TOTALS	1187	748	131	74	112	25	75	84	25	26	59	25	25	25	22

Figure 4: Retrospective estimation of equipment usage

In addition to helping predict departmental supply needs, data acquired on procedures performed can also be helpful in monitoring departmental capacity and growth. Likewise, these data can provide an accurate assessment of procedural numbers to help inform future decisions about capacity for implementation and accreditation of IR training programs.

## **Overview of Available Procurement Resources**

As discussed above, there are many different resources and avenues for obtaining disposable equipment. Initially, an IR site will be largely dependent on the support and donations from private hospitals and non-profit organizations, in addition to donated supplies through grants from commercial vendors. The following list (#1-3) provides a good starting point for contacting organizations to access donated supplies and equipment. It also gives recommendations for international vendors (#4) to reach out to in order to establish industry relationships and more reliable supply chain sourcing.

It is important to note that following list is neither exhaustive nor complete, and it does not represent any specific endorsement from RAD-AID. Instead, it should serve as a sample list to help RAD-AID IR sites begin the process of developing their own procurement network. As every site will have its own unique procurement ecosystem, this process is necessarily dynamic and will change and grow over time.

Additionally, it is important to note that the vast majority of the vendors and organizations on the sample list below will not be local to most RAD-AID IR sites. The true path to a sustainable procurement supply chain would be completely local sourcing of disposable IR equipment. As such, there is a need for local, national and regional production and manufacturing of IR consumables as well as the presence of distribution networks for reliable delivery to healthcare facilities. As a long-term goal, RAD-AID IR sites should strive to help create and maintain these local production economies. A potential avenue for doing so includes supporting local research and biomedical academic programs to help foster in-country innovation and industry. Ultimately, it is important for each RAD-AID IR site to keep in mind the broader medical, social, economic and political contexts in which their growing procurement supply chains will exist and support.

### **1. Non-profit organizations**

- a. Collecting donated medical supplies
  - i. Local hospitals where RAD-AID volunteers work will often contribute donated medical supplies as donations for their employees who are going on service trips abroad. Those RAD-AID volunteers working with an IR site can inquire at their place of employment for supplies to help start a RAD-AID IR site.
- b. Little to no cost to recipient site
  - i. Brother's Brother - <https://www.brothersbrother.org/> a "gift in kind" charity that focuses on medical and educational needs throughout the world
  - ii. Remedy - <https://www.remedyinc.org/> a non-profit which recovers unused medical supplies for the purpose of global aid, waste reduction, and cost-effectiveness
  - iii. Project C.U.R.E. - <https://projectcure.org/> identifies, solicits, collects, sorts and distributes medical supplies and services

- iv. Humatem - <http://www.humatem.org/> French organization which coordinates donations of medical devices to international outreach organizations
- v. International Aid - <http://www.humatem.org/> One of the largest repurposers of medical equipment for use in the non-profit medical service work
- vi. MedShare - <http://www.medshare.org/> Organization specializing in donation of medical supplies
- c. A more exhaustive list of organizations working on donations of medical equipment can be found on the World Health Organization's website here - [https://www.who.int/medical\\_devices/management\\_use/donation\\_org\\_roles.pdf?ua=1](https://www.who.int/medical_devices/management_use/donation_org_roles.pdf?ua=1)

## 2. Commercial Vendors

- a. Certified and in-date equipment
- b. Cost to department
- c. List of commercial vendors
  - i. Medline - Comprehensive healthcare products, <https://www.medline.com/>
  - ii. Cook Medical - Interventional products, <https://www.cookmedical.com/>
    - 1. Scroll to bottom of page, heading "International Distributors"
  - iii. Angiodynamics - Interventional products, <http://www.angiodynamics.com/>
  - iv. Boston Scientific - Comprehensive healthcare products, <http://www.bostonscientific.com/en-US/Home.html>
  - v. Terumo - Interventional products, <http://www.terumomedical.com/>
  - vi. Merit Medical - Interventional products, <https://www.merit.com/>
  - vii. Argon - Interventional products, <https://www.argonmedical.com/>
  - viii. Abbott - Interventional products, <http://www.abbott.com/>
  - ix. Penumbra - Interventional products, <http://www.penumbrainc.com/>
  - x. BTG - Comprehensive healthcare products, <https://www.btgplc.com/>

## 3. Grants/Donations

- a. Cook charitable donation program - [grants@cookmedical.com](mailto:grants@cookmedical.com)
- b. Angiodynamics charitable donation program - [legal@AngioDynamics.com](mailto:legal@AngioDynamics.com), [mdetor@angiodynamics.com](mailto:mdetor@angiodynamics.com)
- c. Boston scientific charitable donation program - [PIGrants@bsci.com](mailto:PIGrants@bsci.com)
- d. Merit medical charitable donation program - <https://www.merit.com/about/grant-request>
- e. Medtronic - <https://www.medtronic.com/us-en/about/corporate-governance/medtronic-charitable-donations.html>
- f. Terumo - <https://www.terumo-cvs.com/about/grants/>

## 4. International vendors

a. Alibaba

i. Aegis lifesciences - gelfoam

1. Sachin Singh, Marketing Executive, Cell No: & Whatsapp No: +91 9512503131 a: 215/216 Mahagujarat Ind. Estate, Ahmedabad, India w: www.aegis-lifesciences.com e:aegis.lifesciences@gmail.com

ii. SCW Medicath LTD

1. Shenzhen SCW Medicath Medical Ltd.  
Operational Address: No. 4, Baolong 6th Road, Baolong Industrial Park, Longgang District, Shenzhen, Guangdong, China (Mainland)  
Website: <http://www.scwmed.com>  
Website on alibaba.com: scw.en.alibaba.com  
\*\*\*has drainage catheters

I. MedPlus Inc.

- A. Operational Address: Floor 4, Building C4, Gaosha Industrial Zone, Zhongcun Street, Panyu Dist., Guangzhou, Guangdong, China (Mainland)  
Website: <http://www.gzmedplus.com>  
Website on alibaba.com: medplus.en.alibaba.com

b. Unisel Pharma (K) Ltd.

i. Third-party vendor for Cook in Europe/Middle East/Africa

ii. Contact: Mr. Sudhir Phadke

1. Email: [sudhir@uniselpharma.com](mailto:sudhir@uniselpharma.com)
2. Phone:
  - a. 00254--2037-44214
  - b. 00254--2037-44355
3. Address:  
1ST FLOOR, APRICOT SUITS  
4TH PARKLANDS  
NAIROBI, KENYA 00623

c. Ablation systems

i. Eco Microwave systems

1. Factory Address : Third Fourth Floors, J5 Building, NJUT Science Technology Industrial Park, No.15 Wanshou Road, Pukou District, Nanjing, Jiangsu, P.R.China.  
Office Address : 10th Floor, Block 2, No 305, Binjiang Plaza Jiangdong  
North Road, Nanjing, China.  
Central Telephone : 025-86262828 025-86262829

Email : [kelvin.w@njeco.com.cn](mailto:kelvin.w@njeco.com.cn)

Kelvin - WeChat 8618951915831

ii. Third party supplier for East Africa

1. Pacificafrica

Prashant Gokarn

Siemens/Medtronic

[prashant.gokarn@pacificafrika.com](mailto:prashant.gokarn@pacificafrika.com)

## **RAD-AID Donation & Distribution Policy**

Having reviewed the different methods of procuring disposable IR stock in the previous section, it is important for site's to familiarize themselves with RAD-AID's official policy regarding the donation and/or distribution of near-expired or recently expired medical devices, as detailed here:

- Definitions:
  - *Near expired*: Within 90 days of expiration date
  - *Recently expired*: Less than 1 year from expiration date
  - *Expired*: Greater than 1 year from expiration date
- Expiration dates on medical devices ensure sterility but do not necessarily imply damage or contamination.
- Near-expired, recently expired and expired medical devices can be used for training use or demo use without restriction.
- Responsibility for clinical use and informing patients of risks related to near-expired medical devices and disposables will be placed on the practitioner and institutional administration although we do not advocate their use as implantable devices.
- We do not advocate the use of recently expired and expired medical devices and disposables for clinical use (exceptions can be considered in life threatening circumstances in which benefits outweigh the risks and implementation on site re-sterilization is encouraged).
- Distribution of near expired, recently expired and expired medical devices to international sites will be contingent upon country standards and regulations regarding their importation and use.
- *RAD-AID IR* will otherwise facilitate the distribution of near-expired or recently expired medical devices and advises general use with the following recommendations:
  - Maintain clean intact packaging and no visible signs of product degradation.
  - Maintained in uncontaminated location prior to distribution and use.

## **Core Procedure Items List**

The following list -- though not exhaustive -- represents the most common procedures performed at RAD-AID IR sites and the recommended equipment recommended to perform them. This list should serve as a guide to help sites organize, gauge and assess their supply needs based on the procedures they expect to perform.

The list is organized into three parts: "IR Procedure Tray" (the generic setup required for most sterile IR procedures), "Non-vascular Procedures" and "Vascular Procedures". Each individual procedure below details the equipment absolutely needed for its execution, as well as recommended equipment to "have available"; that is, extra equipment commonly used to troubleshoot issues or roadblocks encountered during performance of the procedure.

### **IR Procedure Tray "Basic pack"**

- Table drape
- Gloves and gown
- Sterile drape x2 (one for trolley, one for patient)
- Needles, syringes for drawing up and administering local anaesthetic)
- Gauze
- Basins for contrast and saline
- Clamp, scissor, scalpel
- Sharps container

### ***Non-Vascular Procedures***

#### **Abscess drain**

- IR Procedure Tray
- Skin prep solution in line with local guidelines for surgical prep
- Access Needle (Per MD) - 5Fr Micropuncture Needle Set or 5Fr Yueh Needle 10cm
- Drainage Tube (Per MD)
- Drainage Bag- Gravity or Accordion (Per MD)
- 3-Way Stopcock
- Blue cap
- 2-0 Prolene Suture
- Surgical Towels
- 0.9% Normal Saline
- Contrast (Check Creatinine before opening)
- Lidocaine
- Culture Tubes (in line with local procedure)
- 18G Blunt Fill Needle
- Ultrasound Machine and probe cover

### **Biliary Drain placement**

- IR Procedure Tray
- Skin prep solution
- Ultrasound and probe cover
- Chiba Needle 22g 15cm
- Neff 100 Set or Greb Set or Aprima (Ask MD)
- K-50 Tubing
- Amplatz Wire .035 145cm
- Gravity Drainage Bags
- 2-0 Prolene Suture
- Surgical Towels
- Normal Saline .9%
- Contrast (Isovue 300)
- Lidocaine
- Microbiology Form and extra patient labels
- 18g Needle

#### Have Available:

- Nitrex Wire .018
- Benston Wire .035 145CM
- Angled Glidewire .035 180cm
- 5F x 40cm KMP
- Sheath Introducer (Ask MD)
- Biliary Drainage Catheter (Ask MD)
- Dilators (Ask MD)
- Sheath Introducer (Ask MD)
- Dilating Balloons (Ask MD)

### **Gastrostomy tube placement**

- IR Procedure Tray
- Skin prep solution
- buscopan 20mg for injection if no contraindication
- Local anaesthesia (lidocaine / bupivacaine)
- T-Tacks (Per MD) - Cope Gastrointestinal Suture Anchor Set or Kimberly Clarke G-tube anchor set
- Gastrostomy tube +/- peelaway sheath or kit
- 2-0 Prolene Suture
- Hemostats x 3
- K-50 Tubing
- Surgical Towels
- 0.9% Normal Saline
- Contrast (Check Creatinine before opening)

- IF NG TUBE IS ALREADY IN PLACE:
  - 60ml Luer Lock Syringe (Air injection through NG Tube)
  - Extension tubing for 60ml Luer Lock Syringe
- IF NG TUBE IS NOT YET IN PLACE:
  - Catheter for NG Placement (Ask MD for size and type)
  - Guidewire (Per MD)
  - 60ml Luer Lock Syringe (Air injection through NG Tube)
  - Extension tubing for 60ml Luer Lock Syringe
  - Pink Tape to secure NG Tube Placement
    - Topical anaesthesia eg xylocaine spray

Have available:

- 14Fr pigtail catheter or Kimberly Clark Balloon Retention Tube (Ask MD for size and type)
- Benston Wire .035 145CM
- Amplatz Wire .035 80cm
- 8Fr 11cm Sheath
- Angled Glidewire .035 180cm
- Angled Stiff Glidewire .035 180cm
- KMP Catheter 65cm
- Torque Device
- Sterile Water (for Retention Balloon inflation) & 10ml syringe

### **Nephrostomy tube placement**

- IR Procedure Tray
- Skin prep
- Local anaesthetic for injection
- Ultrasound and probe cover
- Chiba needle 22g 15cm
- Access Set: Neff Set, Greb est or Aprima Set (Ask MD for preference)
- Nephrostomy Tube (Ask MD for type and size)
- Nitrix Wire .018 80cm
- Amplatz Wire .035 80cm
- K-50 Tubing
- 2-0 Prolene Suture
- Anaport (Microbiology)
- 18G Fill Needle
- Surgical Towels
- 0.9% Normal Saline
- Contrast (Check Creatinine before opening)

Have available:

- Bentson Wire .035 145cm
- Dilators (Depends on Tube size)

- If Nephroureteral or Double J Stents are being placed have available:
  - 8Fr x 11cm or 8Fr x 23cm Sheath
  - Amplatz Wire .035 145cm
  - Angled Glidewire .035 180cm
  - Torque Device
  - Sterile Tape Measure
  - KMP Catheter 5Fr x 65cm
  - Nephroureteral Stent or Double J Stent (Ask MD for type and size)
- Specimen pot and lab form

### **Percutaneous Liver Biopsy**

- IR Procedure Tray
- Local anaesthesia for injection
- Skin prep
- Ultrasound and probe cover
- Surgical Towels
- 0.9% Normal Saline
- Specimen pot with formalin and/or saline in line with local procedure
- Specimen form

Have Available:

- 17G x 10cm Coaxial Needle
- 18G x 15cm Biopsy Gun
- Gelfoam
- 3-Way Stopcock

### ***Vascular Procedures***

#### **Adrenal Vein Sampling**

- IR Procedure Tray
- Ultrasound and probe cover
- 19g seldinger needle
- 5Fr 11cm Sheath
- Bentson Wire .035 145cm
- Angled Glidewire .035 180cm
- Torque Device
- 5Fr RDC Catheter
- 5Fr SIM2 Catheter
- 10ml BD Syringes x 6
- Surgical Towels
- Heparinized Saline (Unless Patient is HIT)
- Contrast (Check Creatinine before opening)

Have Available:

- 5Fr x 65cm MIK Catheter
- C2 Catheter

### **Mesenteric Angiogram/Embolization (GI bleeding)**

- IR Procedure Tray
- Skin prep
- Local anaesthetic for injection
- 19g Seldinger needle
- Benston Wire .035 145cm
- Angled Glidewire .035 180cm
- Torque Device
- 5Fr 11cm Sheath
- Contrast (Check Creatinine before opening)
- Saline Flush Line
- 3cc Medallion Syringes x 2
- 1cc Medallion Syringes x 2
- Surgical Towels
- Heparinized Saline (Unless Patient is HIT)

#### **Have Available:**

- Table Cover (for embolization table)
- Pigtail Catheter 5Fr x 65cm
- Omni Flush Catheter 5Fr x 65cm
- C2 Catheter 5Fr x 65cm
- RUC (Roberts) Catheter 5Fr x 65cm
- MIK Catheter 5Fr x 65cm
- Microcatheters (Upon MD request)
- Microwires (.018 / upon MD request)
- Microcoils (.018) and MVPS (Upon MD request)
- Gelfoam
- Three way stopcock

### **Chemoembolization/Bland embolization**

- IR Procedure Tray
- Skin prep
- Local anaesthetic for injection
- Bentson Wire .035 145cm
- Angled Glidewire .035 180cm
- Torque Device
- 5Fr 11cm Sheath
- Injector Syringes x 2
- Contrast injector tubing x 4
- Saline Flush Line

- 3cc Medallion Syringes x 2
- 1cc Medallion Syringes x 2
- Surgical Towels
- Table Cover (for Chemo table)
- Heparinized Saline (Unless Patient is HIT)
- Contrast (Check Creatinine before opening)

Have Available:

- Omni Flush Catheter
- C2 Catheter
- SOS Omni Catheter
- SIMS 2 Catheter
- Micro Wires (Upon MD request)
- Microcatheters (Upon MD request)
- Gelfoam
- Three way stopcock

If LIPIODOL + CHEMO:

- 3 Way Stopcocks x 3
- 1cc Medallion Syringes x 2
- 3cc Medallion Syringes x 2
- 6cc Medallion Syringes x 2
- Sterile Medicine Cups x 2(For Chemo and Lipiodol)
- Small White tray filled with Flush Solution

If BEADS + CHEMO:

- 20cc BD Syringes x 2
- 1cc Medallion Syringe x 2
- 3 Way Stopcocks x 3
- Sterile Medicine Cup (For Contrast)
- Small White tray filled with Flush Solution

### **IVC Filter Placement**

- IR Procedure Tray
- Ultrasound and probe cover
- 19g access needle
- 6F 11cm sheath
- Amplatz wire .035 180cm
- IVC Filter (Ask MD for Filter Type) - Gunther Tulip, Option
- Surgical Towels
- Heparinized Saline (Unless Patient is HIT)
- Contrast (Check Creatinine before opening)

Have Available:

- Dilators 7Fr and 9Fr
- Angled Glidewire .035 180cm

## **IVC Filter Retrieval or Foreign Body Removal**

- IR Procedure Tray
- Ultrasound and probe cover
- Micropuncture set 5Fr
- Amplatz wire .035 180cm
- Dilators 8Fr and 10Fr
- Access Sheath (Ask MD)
- Snares (Ask MD for size and type)
- Surgical Towels
- Heparinized Saline (Unless Patient is HIT)
- Contrast (Check Creatinine before opening)

### **Have Available:**

- 9Fr x 55cm Sheath
- Semi and rigid forceps
- Omni Flush Catheter 5Fr x 65cm
- KMP 5Fr x 40cm
- KMP 5Fr x 65cm
- Angled Glidewire .035 260cm
- Torque Device
- Snares: EV3 Trilobe 12-20mm, EV3 Trilobe 18-30mm, Amplatz 20mm Gooseneck, Amplatz 30mm Gooseneck

## **Port Placement**

- IR Procedure Tray
- Ultrasound and probe cover
- Micropuncture set 5Fr
- Amplatz Wire .035 145
- Port (Ask MD size and type)
- Kelly clamp x2
- #15 Blade
- 4-0 Monocryl Suture
- 3-0 Vicryl Suture (with P2 needle)
- Dermabond
- Steristrips (Wide)
- Surgical Towels
- Heparinized Saline (Unless Patient is HIT)
- Lidocaine with Epi (Verify with MD)

### **Have Available:**

- Nitrex Guidewire .018 x 80cm
- Benston Wire .035 145cm
- KMP Catheter 5Fr x 40cm, 65cm
- K-50 Tubing

## **Transjugular Intrahepatic Portosystemic Shunt (TIPS)**

- IR Procedure Tray
- Ultrasound and probe cover
- Micropuncture set
- 8FR and 10FR Dilators
- Amplatz wire 180 cm
- Bentson Wire .035 145CM
- Angled Glidewire .035 180cm
- Torque Device
- 5FR x 100cm Sizing Pigtail Catheter
- 5FR MPA Catheter or 5FR C2 Catheter (Ask MD)
- CO2 System
- Contrast Injector Tubing (2)
- Surgical Towels
- Pressure Transducer Sets (2)
- Heparinized Saline (Unless Patient is HIT)
- Contrast (Check Creatinine before opening)

### **Have Available:**

- RUPS-100 Rosch Ushida TJ Puncture Set
- 10F 38.5 cm curved flexor sheath
- Long Chiba Needle 65cm
- 4FR 65 cm straight or angled Navicross
- Indeflator
- Python Balloon 14mm (Ask MD)
- Dilating Balloons: 6 mm x 6 cm Armada or Mustang, 8 mm x 4 cm ConQuest, 10 mm x 4 cm ConQuest
- Blakemore
- Coils
- Gelfoam
- Lipiodol
- Amplatzter Plugs
- VIATORR Stents

## **Tunneled Line Placement**

- IR Procedure Tray
- Skin prep
- LA for injection
- Ultrasound and probe cover
- Micropuncture set 5Fr
- Amplatz Wire .035 145
- 2-0 Prolene Suture

- Dermabond
- Tunneled catheter (ask MD)
- Steristrips (Wide)
- Surgical Towels
- Heparinized Saline (Unless Patient is HIT)

Have Available:

- Benston Wire .035 145cm
- KMP Catheter 5Fr x 65cm
- MPA Catheter 5Fr x 65cm

### **Dialysis fistulagram / intervention**

- IR procedure tray
- LA for injection
- Ultrasound and probe cover
- 16g venflon
- K50 tubing
- 10ml and 20ml syringe
- BP cuff for temporary occlusion attached to patient above fistula prior to prep

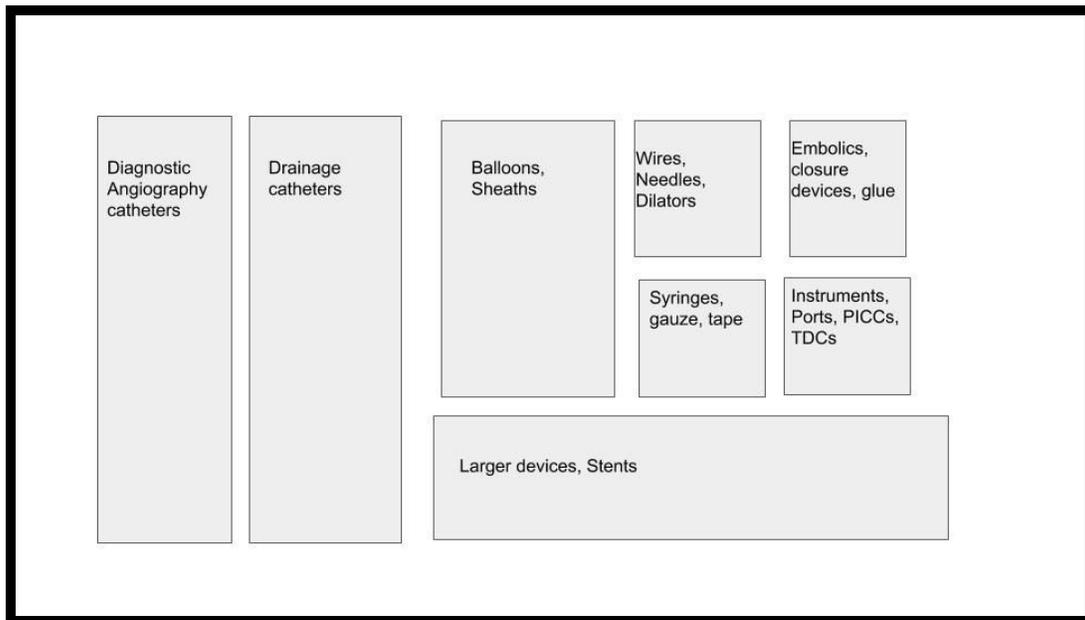
Have available:

- 6F 5cm sheath
- 145cm Bentson wire .035
- 150cm angled hydrophilic wire
- Torque pin
- 65cm 5F C2 catheter
- 65cm KMP catheter
- Heparin for injection
- Selection of .035 / .018 balloons (MD to advise sizes)
- Pressure insufflator

### **Stock Organization, Tracking & Budgeting:**

A critical part of procurement supply chain implementation is accurately and efficiently accounting for stock once it has been acquired. The first component of this process is to effectively organize equipment in the stockroom so that it can not only be quickly and easily accessed, but also readily and efficiently replaced so that there is minimal to no lag time in restocking equipment so as to not negatively impact patient care.

An example stockroom seen in *Figure 5* below illustrates an efficient way to organize IR equipment for rapid access and accurate accounting.



*Figure 5: Example Stockroom Setup*

Appropriate restocking of this room is dependent on use of a combine, which is most commonly a brightly colored card placed near the end of a supply of a given item. When the given amount of a stock item gets low, the reveal of this card alerts people that the item needs to be reordered. In order for this system to run smoothly, it is best to designate a specific individual to be responsible for monitoring stock levels and ordering new items as needed.

Beyond relying on a combine to alert that an item needs to be reordered, it is prudent to establish a more formal tracking system to both monitor usage and anticipate future needs. This system could be paper, computer or web-based and should be performed on a regularly scheduled basis (weekly, monthly, semi-annually, etc). An easy way to do this is to log equipment used after each procedure to keep a running tally on which items from the stockroom have been expended. An example setup for such an equipment log is seen in *Figure 6* below:

Procedure	Number	Standard needle	Chiba needle	Biopsy needle	Coaxial biopsy set	Micro-puncture set	Trocar needle	Standard guidewire	Hydrophilic guidewire	Dilator	Standard drainage catheter	Internal / external biliary drainage catheter	Sheath	Catheter	Dialysis line set
FNA (superficial)															
FNA (deep)															
BIOPSY (non-coaxial)															
BIOPSY (coaxial)															
ASPIRATION (superficial)															
ASPIRATION (deep)															
DRAINAGE															
PCN															
PTBD															
DIALYSIS LINE insertion															
<b>TOTALS</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 6: Sample Post-Procedural Equipment Utilization Log

The daily utilization logs can help establish trends in disposable equipment usage, allowing anticipated future procurement needs. In order to capitalize on such data, it is imperative that master charge sheets be created using available equipment cost information to outline total procedural equipment costs. Figure 7 below provides an example master charge sheet that demonstrates how these wire costs can be estimated and compared using available data.

Procedure/Items needed	Equipment name	Quantity/procedure	Initial order quantity	Comment	Vendor 1 Equipment #	Quantit	USD/set	TSH/set	TSH/item	Keiryu Vendor USD	TSH/item	Procedure Fee (TSH)
<b>US/CT GUIDED BIOPSIES</b>												
	Device Core Biopsy 18G 16CM /with trocar 17g X 13.8cm	1	120		BARD Peripheral Vascular Mission Core Biopsy Kit 1816MSK	BX/5	\$290.00	\$661,200.00	\$66,120.00	38.60	88,000.00	
	3 ways stopcocks	1	120					0	0	0.48	1,100.00	
	10cc syringes	1	120					0	0	0.14	330	
	Gelfoam	1	120					0	0	0.00		
	Formalin container/Path slides	1	120					0	0	0.00		
												440,000.00
<b>US/CT GUIDED DRAINAGES</b>												
	Catheter Centesis 5Fr 10CM	1	40		COOK Yurek 605490	EA	\$16.00	\$36,480.00	\$36,480.00	9.65	22,000.00	
	Needle Trocar 18G 15CM	1	80		COOK G00945	EA	\$8.00	\$18,240.00	\$18,240.00	144.74	330,000.00	
	Wire .035 75cm Super Stiff	1	80		BOSTON SCIENTIFIC AMPLATZ 46-563	BX/5	\$135.00	\$307,800.00	\$61,560.00	28.95	66,000.00	
	Dilator 10Fr 20cm	1	80		COOK G10207	EA	\$7.50	\$17,100.00	\$17,100.00	4.82	11,000.00	
	Catheter Drainage 10F 25cm	1	80		BOSTON SCIENTIFIC Flexima 27135	EA	\$65.00	\$148,200.00	\$148,200.00	144.74	330,000.00	
	Bag Drainage 600 Ml				REMINGTON MEDICAL INC 600-D	CA/20	\$150.00	\$342,000.00	\$17,100.00	0.00		
								0	0			220,000.00
<b>CIRCULATING NEPHROSTOMIES</b>												
	Set Micro-Introducer 21g x 15cm	1	120		BOSTON SCIENTIFIC AccuSlick # 20702	EA	\$92.00	\$209,760.00	\$20,976.00	0.00		
	Wire Nitinol .018 80cm	1	120	NOT ABSOLUTE	MEDTRONIC VASCULAR Nitinol N180802	PX/3	\$175.00	\$399,000.00	\$133,000.00	0.00		
	Wire Amplatz .035 75cm	1	120		BOSTON SCIENTIFIC 46-563	BX/5	\$135.00	\$307,800.00	\$61,560.00	28.95	66,000.00	
	Dilator 10Fr 20cm	1	120		COOK G10207	EA	\$7.50	\$17,100.00	\$17,100.00	4.82	11,000.00	
	Catheter Nephrostomy Drainage 10Fr	1	120		BOSTON SCIENTIFIC Flexima 27-180	EA	\$65.00	\$148,200.00	\$148,200.00	0.00		
	Bag Drainage 600 Ml				REMINGTON MEDICAL INC 600-D	CA/20	\$150.00	\$342,000.00	\$17,100.00	0.00		
								0	0			440,000.00
<b>PERCUTANEOUS TRANSHEPATIC BILIARY DRAINAGE</b>												
	Set Micro-Introducer 21g x 15cm	1	120		BOSTON SCIENTIFIC AccuSlick # 20702	EA	\$92.00	\$209,760.00	\$20,976.00	0.00		
	Wire Angle Glide .035 150cm	1	120		COOK Uniglide HPWA-35-150	BX/5	\$115.00	\$262,200.00	\$52,440.00	0.00		
	Wire Amplatz .035 75cm	1	120		BOSTON SCIENTIFIC 46-563	BX/5	\$135.00	\$307,800.00	\$61,560.00	28.95	66,000.00	
	Catheter KA2 5fr 65cm	1	120		COOK 56538KA2	BX/5	\$50.00	\$114,000.00	\$114,000.00	4.82	11,000.00	
	Dilator 10Fr 20cm	1	120		COOK G10207	EA	\$7.50	\$17,100.00	\$17,100.00	4.82	11,000.00	
	Catheter Biliary Drainage 10Fr 35cm	1	120		BOSTON SCIENTIFIC 27-157	EA	\$65.00	\$148,200.00	\$148,200.00	0.00		
	Tubing Clear 6" (15cm)	1	120		COOK BX/25		\$68.88					
	Bag Drainage 600 Ml				REMINGTON MEDICAL INC 600-D	CA/20	\$150.00	\$342,000.00	\$17,100.00	0.00		
								0	0			222,000.00

Figure 7: Example Master Charge Sheet

**Conclusion:**

An efficient, accurate and timely procurement supply chain is a necessary key for success in any modern IR department. It is a complex process that is inherently individualized to the unique needs and circumstances of every hospital, city, country and region. Nevertheless, there are some baseline commonalities and time-proven methods that can be implemented early on when establishing a RAD-AID IR site. The recommendations provided above provide a framework for a solid foundation upon which each individual IR department can build and grow from as their own unique experiences shape their development.

Please feel free to share with RAD-AID your successes, failures, advice, lessons learned, etc. so that we can continue to improve the IR procurement implementation process for the benefit of global health IR.

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