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The Projected Al Qaeda Use of Body Cavity Suicide Bombs Against High Value Targets

Robert J. Bunker



GroupIntel

Occasional Paper

March 2011



**TERRORISM
EARLY WARNING GROUP**

*This occasional paper is dedicated to the years of innovation and
achievement accomplished by the network of visionary
individuals who comprised the
Los Angeles Terrorism Early Warning Group
1996-2009*

We will always remember your sacrifices and service for the public good

Foreword

One of the most significant challenges facing the law enforcement and intelligence communities is predicting how adversary tactics will adapt over time. In order to resist the comfortable conundrum of always protecting against yesterday's threats and not tomorrow's, we need to look at emerging trends and attempt to predict future behavior.

In this paper, Robert Bunker has compiled year's worth of painstaking research to identify one of these emerging trends. This paper serves not only to inform and educate on past TTP, but also predict more extreme adaptations. In reading his analysis, it is hard to disagree with his concerns and conclusions that we will inevitably face this threat in the United States.

I was first introduced to this topic through Dr. Bunker's work with the Los Angeles Terrorism Early Warning Group. We appreciate the opportunity to publish this work through the GroupIntel family of sites.

GroupIntel and the GroupIntel Network were established to connect the top international security experts in the world to engage in collaborative research, analysis, and information sharing. With over 350 members, the GroupIntel Network is the perfect forum for the distribution of cutting edge analysis like this paper by Dr. Bunker.

Matt Devost

Founder

GroupIntel Network

March 2011

Preface

Body Cavity Bombs and the Barbarization of Terrorism

Terrorism, or the instrumental use of violence by sub-national or non-state actors for political ends, has been a constant for many years. Terrorism persists because it offers tactical and sometimes strategic advantage to those who employ it. As part of this dynamic, countermeasures by security services, new technologies, and political considerations bring tactical innovations (new weapons), shifts in targeting (new targets), and new tactics, techniques or procedures (TTPs) such as car bombs, suicide bombings, and swarming attacks.

As terrorist campaigns (or insurgent campaigns employing the use of terrorist tactics) persist in duration, the level of violence often increases. That is, the longer the campaign, frequently the more brutal or barbaric the nature of attacks. Suicide bombings (human- and vehicle-borne) have been a staple of terrorist strategy and tactics. They provide a means of low-cost precision targeting that amplifies casualties and ensures the attacks are noticed. As countermeasures (weapons screening, searches, etc.) become more effective, a shift in targeting and/or TTPs is a likely terrorist adaptation.

Dr. Robert J. Bunker has been working for the last few years on assessing the potential use of body cavity bombs (BCB) or body cavity suicide bombs (BCSB) as a variation of suicide bombing tactics, techniques, and procedures (TTPs).¹ Sadly or on the indications and warning (I&W) side fortunately, it seems by careful analysis of transactions and signatures, trends and potentials, and capabilities and intentions (*i.e.*, the Transaction Analysis Cycle)² Dr. Bunker has forecast a terrorist innovation...

Awareness of this barbaric potential has been increasing among the security services. For example, the French intelligence service has warned of a new terrorism threat from suicide bombers carrying in-body explosives that can't be detected by standard airport screening. The method is suspected in a failed attempt to kill the Saudi anti-terrorism chief in August 2009. According to *Der Spiegel*, "French anti-terrorism experts have warned that suicide bombers carrying explosives inside their bodies pose a

¹ See for example, Robert J. Bunker, "Body Cavity Suicide Bomb (BCSB) Potentials: Airliner, VIP, and Other High Value Target Sets." *Terrorism, Global Security and the Law. 2nd Annual Los Angeles Terrorism Early Warning Group Conference*. 19-20 October 2006. The RAND Corporation, Santa Monica, CA.

² For a description of the Transaction Analysis Cycle, see John P. Sullivan, "Analytical Approaches for Sensing Novel and Emerging Threats," Panel on Novel Risks, Future Threats: The Emerging Global Security Landscape, *49th Annual ISA Convention*, San Francisco, CA, USA, 29 March 2008; available at http://www.groupintel.com/wp-content/uploads/2008/04/isa2008_jps_novel_emerging.pdf.

new threat to air traffic, French newspaper *Le Figaro* reported.”³

Standard metal detectors at airports can’t detect in-body explosives and full X-ray screening would be needed to spot them. Awareness of this security gap is increasing; for example, the *Daily Mail* (UK) reported: “Britain is facing a new Al Qaeda terror threat from suicide ‘body bombers’ with explosives surgically inserted inside them. Until now, terrorists have attacked airlines, Underground trains and buses by secreting bombs in bags, shoes or underwear to avoid detection. But an operation by MI5 has uncovered evidence that Al Qaeda is planning a new stage in its terror campaign by inserting ‘surgical bombs’ inside people for the first time.”⁴

By 2010, the European Police Agency (Europol) had issued an assessment of BCBs. According to the Europol assessment: On 27 August 2009, at about 2330 hours (local time), in Jeddah (Saudi Arabia) a suicide bomber tried to assassinate the Assistant Interior Minister of Saudi Arabia, Prince Muhammad bin Nayef. Muhammad, who is also the son of the country's Interior Minister, was lightly injured in the attack. According to several media worldwide, the suicide bomber (Abdullah Al-Asiri) had hidden the improvised explosive device (IED) in his rectum and activated it once close to the Prince.

Europol assessed the possible use of a new *modus operandi* (M.O.) for suicide bombings despite the fact that it was not possible to officially confirm the hypothesis about the place of the IED’s concealment and the means used for its activation. The research supporting the Europol report found that: 1) It would be possible to explode a device concealed in the rectum; 2) Activation by radiofrequency seems to be the M.O. for this terrorist attack; and 3) Concealing an IED in the rectum would limit the amount of explosive available.

Finally, Europol assessed that “Should there be conclusive proof that the attack took place with an IED concealed inside the perpetrator’s body, it would definitely have an impact in aviation safety and the current standard operational procedures in place should be reviewed. Passengers are screened through metal detectors, in some airports even through explosive detectors, but the sensitivity and power of these machines would need to be increased or reviewed, in order to overcome shielding of the device by the human body.”⁵

BCB potentials are not limited to human-borne improvised explosive devices (IEDs). As recent open source reports have highlighted, the use of canine-borne BCBs is also a stark potential. Al-Qaeda operatives in Iraq allegedly tried to unleash terror in the skies by deploying a pair of kamikaze canines on a US-bound plane according to French

³ “France Warns of New Terror Threat From ‘Body Bombs’,” *Der Spiegel*, Spiegel Online, 06 October 2009.

⁴ Christopher Leake, “Terrorists ‘plan attack on Britain with bombs INSIDE their bodies’ to foil new airport scanners,” *Daily Mail*, 30 January 2010.

⁵ “The concealment of Improvised Explosive Devices (IEDs) in rectal cavities,” Europol, SC5 - Counter Terrorism Unit, The Hague, EDOC#418506_v4, 18 September 2010.

newspaper reports. The plot failed because the bombs were so badly stitched inside the dogs that they died, reported the Paris daily *Le Figaro*.⁶

Dr. Bunker's analysis in this *GroupIntel Occasional Paper* captures the patterns of threat evolution from potential to actualization. After looking at suicide bombings in general, he evaluates the indicators of BCB threat evolution (including an in-depth discussion of TTPs). After looking at precursor incidents, he assesses the Abdullah Al-Asiri incident in detail. He provides extensive endnotes, and an addendum with endnotes making this a comprehensive assessment.

This is an important contribution to the literature in several regards. First, it relies exclusively on open source materials (illustrating the value of OSINT as an intelligence discipline). Next, it demonstrates the value of early warning efforts to anticipate and detect evolving and emerging threat vectors and novel or evolving TTPs. Finally, it sounds an alarm. As the barbarization of terrorism continues, we can expect new TTPs to be employed in order to overcome countermeasures and maximize operational success from a terrorist perspective. Body cavity bombs are indeed an emerging threat.

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March 2011

⁶ Bill Sanderson "Failed Al Qaeda plot involved sewing bombs inside dogs," New York Post, 06 November 2010. See also: Ian Sparks, "The sick Iraqi terrorist plot to bomb a U.S. plane with exploding DOGS," Daily Mail, 05 November 2010; for additional background see: Jean-Marc Leclerc, "Avions de ligne: la menace des chiens kamikazes," Le Figaro, 01 November 2010.

The Projected Al Qaeda Use of Body Cavity Suicide Bombs Against High Value Targets

Robert J. Bunker

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This work is initially derived from a non-public disclosure series of early warning presentations, first delivered in September 2006, by the author on the projected terrorist use of body cavity suicide bombs against high value targets. Subsequent terrorist use of such a device, in August 2009 in Saudi Arabia by an Al Qaeda operative, has allowed for this body of research (along with post-incident analysis) to now be published in an open venue. The work provides a historical overview of the use of suicide bombs by military forces and terrorists; addresses the co-evolution of suicide bombs and countermeasures by security groups; analyzes future suicide bomb placement options; and explores Islamic views on the acceptability of foreign object placement in body cavities. It then focuses on issues pertaining to body cavity bomb placement options; bomb components, assembly, and detonation issues; putty, cheese, and the Fadhel al-Maliki incident; Al Qaeda use validation— the Abdullah al-Asiri incident; and concludes with a discussion on body cavity bomb countermeasures and strategic use implications. The work signifies the value of early warning and futures analysis applied to counter-terrorism activities and also highlights the tensions and inherent contradictions involved with individuals who wear the dual hats of practitioner and scholar. These individuals, given the requirements of operational security and secrecy, are challenged with ensuring that open discourse and publication in no way threatens the greater public good.¹

As an introduction to this topic, it is immediately noted the ways in which state-based conventional military forces engage differently in warfighting vis-à-vis non-state terrorist and insurgent groups. While conventional forces primarily rely upon stand-off attacks, the maneuver of forces in the battlespace, and the destruction of forces and seizure of objectives within the context of the rules of warfare, non-state groups prefer dimensional-shifting (stealth masking), disruptive targeting, and criminal combatant values which reject the rules of war. While both military forces and terrorists may at times have common origins and influences stemming from similar military traditions, it will be seen in the following historical overview that their orientations to suicide operations and bomb use is very different with militaries and para-militaries focusing on personnel and hardware systems targeting and non-state groups— specifically terrorists— ultimately selecting their targets in order to generate terror.²

Use of Suicide Bombs by Military Forces and Terrorists

Historically, Western, Islamic, and Oriental military traditions all have sanctioned, and at times promoted, differing forms of suicide operations.³ The three-hundred Spartans at

Thermopylae (480 BC), Hussein and his small group of followers at Karbala (680), the Mangudai unit of the Mongols (13th century), and the nearly two hundred American defenders of the Alamo (1836) are all considered celebrated martyrs and heroes within their own respective cultural groupings. Bombs have been used in what have turned out to be suicide operations, sporadically, for hundreds of years now. Such military operations would include the mining of city walls, fortifications, and later trench lines or the blowing up of fortress gates, warships, or opposing troops and their materiel.⁴ In the vast majority of these early incidents, the individual utilizing the bomb had no intention of committing suicide. Rather, pre-detonation was the common factor though, in some rare instances, the severe wounding or entrapment of a soldier, an assassination carried out by a 19th century anarchist, and the separate capture of a 19th century anarchist resulted in intentional suicide via detonation.⁵

The modern use of strap-on, carried, and vehicular suicide bombs as a conscious military policy, however, can be traced back to the Second World War. This use policy was found primarily in the Pacific Theater later in the war as losing Japanese forces resorted to more extreme measures, derived from the philosophical tenets of Bushido, to stop the advance of the opposing allied forces. Japanese soldiers carrying satchel charges willingly jumped onto American tanks and detonated themselves, engaged in mass infantry (*Banzai*) charges lead by officers carrying samurai swords, and rammed their bomb laden aircraft (*Kamikazes*) and manned-torpedoes (*Kaitens*) into allied warships. Other belligerents in this war, including the Italians, Germans, and Russians also utilized their own suicide units and tactics although to a far lesser extent than that of the Japanese forces that readily choose death over surrender.⁶

Post-Second World War use of suicide bombs was extremely marginal until the 1980s in the Middle East. During the Vietnam War, the Viet Cong utilized specialized sapper units that engaged in infiltration and detonation tactics. Their use was chronicled in a work focusing on their successful attack on US Firebase Mary Ann in March 1971. While the Viet Cong tactics utilized were extremely risky, the sappers did not normally detonate their satchel charges while holding them.⁷ This analysis is in contrast to some soldier accounts and movie images of US command posts and aircraft, such as helicopters on the ground, being destroyed by Viet Cong and also North Vietnamese Army (NVA) suicide sappers during the course of the conflict.⁸

Contemporary terrorist use of suicide bombs can be directly traced back to a military engagement that took place during the Iran-Iraq War of 1980-1988. The celebrated action of Hossein Fahmideh, a 13-year old boy who destroyed an Iraqi tank at the Battle of Khorramshahr in 1982, was the focal event. Hossein sacrificed his own life while detonating a satchel charge underneath an Iraqi tank in a final act of desperation.⁹ This child soldier's act resonated with the cult of the martyr in Iran, exemplified by the Fountain of Blood in Tehran and the wearing of "keys of paradise" by Iranian children who engaged in minefield clearing.¹⁰ As a result, this suicide bombing action was praised and lauded by the spiritual leaders of Iran. This technique quickly evolved and become an operational component of the Hizbollah organization, composed of former Iranian Revolutionary Guards, and was exported to Lebanon in the fight against the Israeli

Defense Forces (IDF). These suicide bomber attacks, specifically utilizing vehicular borne improvised explosive devices (VBIEDs), targeted Israeli military convoys and assets. In addition, foreign military and diplomatic facilities were targeted and destroyed by Hizbollah operatives.¹¹ Whether these suicide attacks can be considered legitimate military targeting of opposing military (and political) assets is debatable. The US categorizes the bombings of its Embassy and Marine Barracks in Beirut in 1983 as terrorist acts—Hizbollah and their Iranian handlers would argue otherwise.

What is not under debate is the fact that suicide bomb use proliferated from the latter 1980s on, as terrorist groups began to use this form of attack not only to target military, law enforcement, and political targets but also innocent civilians.¹² The Tamil Tigers engaged in their first suicide bombing in 1987, Hamas in 1993, Palestine Islamic Jihad (PIJ) in 1994, Kurdistan Workers Party (PKK) in 1996, Al Qaeda in 1998, the Chechens in 2000, the Al –Aqsa Martyrs Brigades in 2002, and the Taliban in the 2003/2004 period.¹³ Since the early 1980s, well over a thousand contemporary suicide bombings have taken place with the vast majority of incidents clustered in the Israeli area of operations, Iraq, Afghanistan, Pakistan, and Sri Lanka. These bombings include explosives strapped to individuals or carried by them, and also the use of explosive laden cars and trucks, seacraft, aircraft, bicycles, and even animals. While most of the bombs used have been conventional in form, an evolutionary process has been taking place for well over a decade and a half now with regard to some of the suicide bombs worn or carried by terrorists. This evolutionary process has been triggered by the countermeasures employed by security forces to interdict individuals functioning as suicide bombers. Each innovation in suicide bombs has, in turn, been followed by an innovation in countermeasures, ultimately resulting in an action-reaction cycle of co-evolutionary adaptation.

Co-evolution of Suicide Bombs and Countermeasures

Numerous works have been written on the subject of the terrorist use of suicide bombing, the motivations behind these bombings, the perpetrators, and the incidents themselves.¹⁴ While such studies and analyses are of immense value to the field of terrorism studies, our interest focuses on information that pertains to the needs of counter-terrorism practitioners such as intelligence units, security screeners, and bomb squads. Specifically, the evolution of terrorist tactics, techniques, and procedures (TTPs) as they apply to the employment of worn or carried suicide bombs is of primary concern.

This evolutionary process generally took place in Israeli areas of operation initially and then became globalized as the suicide bomber threat matured and proliferated into other countries and regions of the world.¹⁵ These bombings are for the most part, save for those carried out by the Tamil Tigers, representative of the military-like suicide operations carried out by radicalized Islamic terrorists. These terrorists are drawn from both the Shia and Sunni faiths and, in the past, from some secular elements (Saddam Hussein deployed secular suicide bombers against coalition forces in Iraq)¹⁶—although currently they are almost all exclusively religious in their motivation, with Al Qaeda supported and influenced suicide bombers now dominating.

An evolutionary pattern of suicide bombs and countermeasures to them (for there is no evolution without environmental stressors to cause some sort of selection process) can be generally identified. The resulting cycle of co-evolutionary adaptation is not clean and clear-cut but rather has many gray areas pertaining to time and location, and even evolutionary variants, as different terrorist groups evolve and devolve in their worn or carried suicide bomb TTP use.¹⁷ Sometimes these groups even simply revisit earlier methods of attack as they constantly probe the defenses of their intended targets. The evolutionary pattern is as follows:¹⁸

Military Mines, Charges, and Grenades

Early suicide bombs are derived from military munitions such as satchel charges, grenades, and mines. These military grade devices are ruggedized for field use, relatively safe to use with low incidents of pre-detonation, explode with great force, and are reliable. Military forces engaging in suicide attacks against other military forces were the dominant users of these munitions, however, insurgent and non-state groups also utilized these munitions against military and political targets. These types of suicide bombs have also sporadically been employed by terrorist groups against civilian targets and at times are preferred in their use but difficult to obtain. Their operational advantages can, however, be outweighed by the fact that they are readily recognizable as threat devices and their size and bulk can be difficult to camouflage with clothing. These devices are vulnerable to standard screening and sensing measures.

Standard Suicide Bombs

These bombs are known as improvised explosive devices (IEDs), are not military grade in quality, and have been produced since the late 1980s. The explosives used may be of military or commercial origin, are packed with shrapnel derived from nails, bolts, and ball bearings, and use a common button or trigger detonation system. Hence, just like in the above employment of military munitions, blast effects and fragmentation are used to kill the intended targets in a terrorist act. Deadman switches, which cause detonation upon release of a grip or button, and cell phone detonation backup are also a potential component of these devices. Reliability and sophistication of these devices is determined by the skill and knowledge of the bomb-maker. These bombs are usually carried in suicide belts or vests which can be overtly worn for intimidation purposes or as a rescue deterrent, as was done by the female Chechen black widow bombers during the Moscow Theater and Beslan hostage taking incidents in Russia in October 2002 and September 2004, respectively.¹⁹ For typical tactical deployment, loose fitting jackets or coats cover these belts and vests. More sophisticated ruses have included the bomber appearing as an Orthodox Jew, as security or emergency response personnel, and as well-wishers at political rallies. In the latter case, the former Indian prime minister Rajiv Ghandi was assassinated by a female Tamil Tiger operative in 1991 while he publicly received greeters. These devices are vulnerable to conventional metal detectors and explosive detection systems though some Tamil Tiger suicide devices are airtight and have wire coatings to reduce chemical vapor signatures.²⁰ The vast majority of suicide bombs are of this class and the following one.

Non-Fragmentation and/or Non-Standard Explosive Suicide Bombs

These bombs are meant to bypass basic security and screening measures that detect conventional explosives and/or metal components found in standard suicide bombs. These suicide bombs kill by blast effects (heat and overpressure) and secondary fragmentation derived from bone fragments, pocket change and keys, window glass, wall sections, and other nearby items forcibly propelled by the detonation of a bomb. Further, the explosive used to create the blast need not be military or commercial grade but rather can be generated by an improvised mixture such as those with a hydrogen peroxide and acetone base. Low metal content suicide bombs date to at least the early 2000s and have long been addressed in briefings provided by Israeli security and returning US bomb technicians from Israeli to domestic US law enforcement and public safety audiences. Suicide belts manufactured in the West Bank in 2006 have utilized liquid explosives²¹ and can either be created with or without metal shrapnel for fragmentation purposes. Substituting marbles, as a form of glass shrapnel, which will evade metal detectors is also a consideration. In 2007, thirty-one liquid explosive devices were confiscated in Lebanon “in the vicinity” of the Ain el-Hilweh Palestinian refugee camp. These devices were mounted on a board, contained two tubes of blue liquid, and contained electro-chemical timers-detonators of eastern European origins.²² Countermeasures to this class of devices include suspected bombers being interrogated from stand off ranges, forced to lift up their shirts or remove articles of clothing, or the use of non-standard explosive sensing systems.

Suicide Bombs Disguised within Benign Objects

For period of time in the Palestinian-Israeli conflict, the heightened security measures employed by the Israelis resulted in the various Palestinian terrorist groups occasionally disguising their suicide bombs so that they looked like benign objects. Examples of these bombs include a device hidden in a guitar case (August 2001), in the bottom of a birdcage (March 2002), and in a computer (January 2004).²³ All of these bombs were interdicted except for the guitar case bomb which was successfully detonated to devastating effect. The guitar case bomb was used in the suicide bombing of the crowded Sbarro Pizzeria in Jerusalem during lunch time. The 5-10 kg device was packed with nails, screws, and bolts and resulted in 15 deaths and 130 injuries.²⁴ Al Qaeda examples of these forms of bombs are the camera bomb used in the assassination of anti-Taliban leader Ahmed Shah Masood (“the Lion of Panjshir”) in early September 2001 in Afghanistan by a suicide bomber posing as television cameraman and the bomb found in a laptop in the hotel room of the Al Qaeda operatives who targeted the Marriot and Ritz-Carlton hotels in July 2009 in Jakarta.²⁵ Added to this list of Al Qaeda operations should also be the British subway and bus bombers in July 2005, who placed their bombs in backpacks and blended in as students and/or blue collar workers, killing 56 and injuring about 700 in their four suicide explosions. Benign object devices may or may not contain ball bearings for fragmentation, utilize a standard contact detonator, and have a back up cell phone detonator. Countermeasures to these devices are somewhat problematic because they are typically taken inside non-physically screened venues. Use of informants and the monitoring of out-of-place behaviors on the part of the would-be

bombers have been the only warnings provided in the past in some of these types of incidents.

Suicide Bombs Worn Close to the Human Body

Unlike suicide bombs which are worn on the outside of one's clothing such as explosive vests and belts or sewn directly into jackets, these bombs are placed as close to the human body as possible. The typical locations are under the female breasts and in the groin section for both sexes. The intent is to bypass security screening that is less intrusive and more conservative in nature so that it does not culturally offend those being screened. In the case of bra bombs, the Tamil Tigers utilized them in both 2004 and 2007, with the latter incident being an assassination attempt against a Sri Lankan minister conducted by a handicapped bomber who had had polio.²⁶ The design of these devices is unique:

One of the latest technological innovations, according to a well-informed specialist based in Singapore has been the development of a heart-shaped suicide vest, which is worn by a woman and designed to hold explosive slabs in two bra cups surrounding the breasts. Charges are detonated via one of two triggering mechanisms: one runs up the centre of the torso and one is placed under the armpit.²⁷

Prior to the Tamil incidents, in March 2002, a Palestinian teenager, Ayat al-Akhrass, used a Semtex stuffed bra to detonate herself in a Jerusalem supermarket, killing two shoppers.²⁸ Chechen terrorists, who have had past links to Al Qaeda, are also thought to have possibly utilized bra bombs to take down two Russian commercial jetliners.²⁹ Amanat Nagayeva and Satsita Dzhbirkhanova, in August 2004, each detonated a small device which blew up two domestic flights almost simultaneously, killing 89 persons.³⁰ While not a direct reaction to these incidents, but rather the August 2006 liquid bomb scare in London, women were later cautioned not to attempt to wear gel bras on commercial aircraft.³¹

In the case of underwear bombs, Palestinian Wafa al-Biss was caught in June 2005 with 20lbs of high explosives hidden in her underwear because security personnel noticed that as she walked towards them her gait was off. She was subsequently made to strip off her clothes at standoff range and the bomb was disarmed.³² Palestinian terrorists subsequently attempted to bypass this countermeasure by then placing bombs around an operative's ankles so that when they dropped their pants no bomb would be found. The use of underpants bombs to carry out suicide attacks was later evident in Pakistan in 2008 according to police forensic lab sources.³³ US and British airport security personnel have been on alert for explosive devices placed within or sewn into undergarments since at least the 2005 time period.³⁴ Past screening checkpoint countermeasures to these devices have been thorough pat downs and body searches or the suspect's removal of clothing in a side examination room.

Hybrid Suicide Bombs Worn or Carried

These bombs combine multiple attributes from the preceding devices, such as liquid explosive bombs, that make them much harder to detect because of how they are hidden, the type of explosive utilized, their low metal content, or the means of detonation. They are intended for use against primarily high value targets and targets with heightened levels of security protecting them. Examples of the forms these hybrid suicide bombs can take and the actual terrorist incidents they are tied to are as follows:

Richard Reid's Shoe Bomb: On December 22, 2001, the Al Qaeda operative Richard Reid, a British citizen, attempted to detonate a shoe bomb on American Airlines Flight 63 traveling from Paris to Miami in Seat 29J next to the window.³⁵ Each of Reid's ankle high-hiking shoes contained an explosive charge of PETN (about 50 grams)³⁶ in the sole with an improvised detonator containing non-commercial explosive wrapped in paper, likely TATP, which was to be set off by lighting a black powder fuse. Reid pulled the free end of the hidden fuse through the inner sole and out of the right shoe. He then lit approximately six matches in successive attempts to set off the device but was ultimately discovered by crewmembers and passengers and restrained from making any more attempts to detonate the bomb. In the process of lighting the fuse, the end of it became melted which suggests that the black powder had become moist. This is attributed to possible perspiration built up from Reid wearing the shoes the day before during the aborted attempt of getting on Flight 63 on December 21, when extra questioning and searches by suspicious security personnel forced him to miss the flight. The FBI later determined that, if detonated, the shoe bomb had enough explosive force to breach the outside skin of the aircraft.³⁷ Given Reid's seat placement on the 767-300 international aircraft, the force of the blast would have torn a hole in the fuselage directly aft of the right wing containing one of the aircraft's fuel tanks.³⁸

The bomb Reid was carrying contained no metal content, was well hidden in his footwear, utilized a low technology detonation method, and carried enough explosives to breach the skin of the aircraft, possibly causing a secondary explosion in the fuel tank found in the right wing and/or structurally destabilizing that wing in addition to the hull fracturing and decompression that would have been associated with the initial blast. The specific countermeasure to this form of suicide bomb is to require all airline passengers to take off their footwear for x-ray screening at airports. This protocol was implemented right after Reid's failed bombing attempt.

Four years later, in 2005, Sajid Badat, another British Al Qaeda operative, was sentenced to prison in England for his part in the 2001 shoe bombing plot. He was to target a different commercial airliner with his own shoe bomb at the same time Reid was to detonate his bomb on Flight 63. Badat, however, lost his nerve and withdrew from the operation. Interestingly, in light of the recent Abdulmutallab incident (discussed later) the plan was for Badat to take a flight from Manchester to Amsterdam and then from Amsterdam to the United States at which point he was to detonate the explosive device.³⁹

Concerns over the use of shoe bombs resurfaced again with a successful suicide attack by a shoe bomber against a Baghdad mosque in June 2006. At least 11 people were killed and 25 injured in the attack that bypassed the stringent security measures that had been enacted. Speculation existed that the attack was carried out by an Al Qaeda operative as revenge for the killing of Abu Musab al-Zarqawi who was the former leader of Al Qaeda in Iraq.⁴⁰ This was followed by a Department of Homeland Security (DHS)-FBI bulletin issued in October 2007 over concerns of terrorists smuggling electric blasting caps in the soles of hollowed out shoes in Europe. The modified footwear in this instance was not worn but rather concealed in luggage and was being transported by bus across international borders for use in a terrorist attack.⁴¹

Ramzi Yousef's Bojinka and London Terrorists' Liquid Bomb Plots: In early January 1995, a fire broke out in a safe house in Manila where Abdul Hakim Murad, an Al Qaeda operative, was involved in burning chemicals to dispose of them with other co-conspirators. Murad was captured and interrogated and divulged a plan, known as Bojinka, to target and blow up with liquid explosives up to a dozen commercial airliners flying over the Pacific to the United States. Implicated in this plot was Ramzi Yousef who was the mastermind of the 1993 World Trade Center Bombing:

According to the plan, five individuals would place bombs aboard twelve United States-flag aircraft that served routes in Southeast Asia. The conspirators would board an airliner in Southeast Asia, assemble a bomb on the plane, and then exit the plane during its first layover. As the planes continued on toward their next destinations, the time-bombs would detonate. Eleven of the twelve flights targeted were ultimately destined for cities in the United States.⁴²

While this plot was not intended as a suicide bombing operation, it conceptually formed the basis of the later London-centered plot that would emerge—the liquid explosive based bombs, in this instance nitroglycerin placed in cleaning lens solution containers, were to be assembled on the planes in flight and then detonated.⁴³ Yousef conducted a limited test bombing on December 11, 1994 on a Philippine Airlines flight from Manila to Cebu to Japan that killed one individual and injured others.⁴⁴

Eight years later, in August 2006, a suicide bombing plot originating out of London to blow up seven airliners to the United States was foiled following the arrest of two dozen British-born Muslims. The intent was to kill thousands in an attack that would rival that of 9-11. This Al Qaeda plot was derived from smuggling liquid (gel) explosives dyed red in sports bottles onto the airliners. The sports drink (500ml of Oasis or Lucozade) was to be emptied out from a small hole in the bottom of the bottle, refilled with explosives by means of syringe, and the hole filled with glue so the drink would appear factory sealed. The hydrogen peroxide based bombs were to be assembled by means of combining the liquid explosive with a detonator and then triggering the device. The detonator was composed of HMTD (hexamethylene triperoxide) made from household ingredients and disguised as AA batteries. A simple flash bulb connected with wires to a disposable camera would in turn trigger the detonator. As an added layer of

operational security, pornographic magazines and condoms were to be carried in the perpetrators' luggage to mask their Muslim beliefs.⁴⁵ In retrospect, this suicide bombing approach was both unique and creative in that it combined what appeared to be innocuous objects—a sports drink, double AA batteries, and a throwaway camera—into a highly lethal explosive device.

The security countermeasure to this threat was initially to ban all liquids and gels from being carried onto commercial flights. This was later modified by the Transportation Security Administration (TSA) following the 3-1-1 rule once explosive thresholds for liquid and gel based devices were determined. This protocol allowed for 3.4 ounce (100 ml) bottles or less placed in a 1 quart-sized, clear plastic zip-top bag with 1 bag allowed per passenger whom would place it in the screening bin. Larger amounts of liquids, such as medications, baby formula and food, and breast milk are allowed in reasonable quantities and must be declared and checked at the screening checkpoint.⁴⁶ Another countermeasure to these bombs are laser sensing liquid explosive scanners which are now being deployed to airports.⁴⁷

Umar Farouk Abdulmutallab's Underwear Bomb: On Christmas Day 2009, the Nigerian national Umar Farouk Abdulmutallab attempted to detonate an explosive device hidden in his underwear on Northwest Flight 253 from Amsterdam to Detroit during its final descent.⁴⁸ This Al Qaeda plot originated from Yemen, a current hotbed of terrorist activities and conspiracies. The bomb was composed of about 80 grams (less than 1/2 a cup in volume) of the explosive PETN that was sewn into the underwear in a six-inch long pouch hidden next to the terrorist's genitalia. Based on photos of the pouch, it appears to be wrapped in some form of plastic to avoid contact with the skin. This precaution is undertaken because of explosive toxicity concerns and also to limit moisture transference between the human body and the explosive. Detonation of the device was attempted via the use of an acid-filled syringe that was intended to cause a chemical reaction, the triggering event, which would set off the bomb. While engaging in this act, Abdulmutallab pulled a flight blanket over himself to disguise his actions. Instead of the bomb exploding, it flared up like an incendiary device, and partially burned both Abdulmutallab and the blanket over him, due to a detonation malfunction probably resulting from loss of density of the explosive mass. Quick thinking on the part of a Dutch passenger and others aboard the flight led to the extinguishing of the resulting fire and the placing of Abdulmutallab under restraint.⁴⁹

Had the device detonated, its yield and placement, in seat 19A of the A330-300 which is next to the skin of the aircraft, in the center of the wing, and by a fuel tank, would possibly have been catastrophic.⁵⁰ Conceptually the device is advanced in design because of its lack of metal content, its placement next to the male genitalia that makes it hard to detect, its subtle detonation method via chemical reaction, and a PETN payload larger than that of Richard Reid's shoe bomb. Specific security screening countermeasures to the use of this device include pat downs (which are tricky due to its positioning), backscatter imaging, and explosive sensing. Of these countermeasures, backscatter imaging, also known as whole-body-imaging (WBI), is being advocated by

the US Transportation Security Administration (TSA) for widescale use in airports as the dominant defensive response to these types of suicide bombs.

Future Suicide Bomb Placement Options

The co-evolution of suicide bombs and countermeasures provides a few key lessons learned. The first is that terrorists are attempting to disguise the bomb so that the individual carrying it is not considered a threat by those observing them. This is being done by either making the bomb look like something benign—like a musical instrument, child’s toy, or laptop— or rendering it invisible. Invisibility is achieved by placing the bomb closer and closer to the human body in order for it to remain undetected. While it could also be argued that placing the bomb in a benign object partially renders the bomb invisible, the object it resides in is readily visible to security and counter-terrorism personnel. The second lesson learned is that on a non-visual sensing level, such as those utilized by olfactory and magnetometer systems, signatures derived from the chemicals found in explosives and detonators (including those cell phone initiated) and metals in the bomb are being suppressed or even eliminated. Procedures utilized to achieve this include switching to non-standard explosives, attempting to mask the vapors emanating from the explosives, going to non-fragmentation bombs, and using low-to-no metal content detonators. The third lesson learned is that terrorists are running out of carry-on and next-to-body bomb placement options vis-à-vis ever improving security screening technologies and procedures. Delivering the bomb to a high value target, be it a dignitary or a commercial airliner, is becoming increasingly difficult as layers of security are tightened around the intended target. This is a natural outcome of the co-evolutionary process between offensive suicide bomb employment and defensive measures specifically meant to counter the probability of success of this form of terrorist activity. With these lessons learned, only a finite number of future options exist in order for terrorists to continue to use suicide bombs against high value targets. These options are as follows and can be viewed as potential evolutionary successors to the hybrid suicide bombs worn and carried by terrorists today:

Explosive Clothing Bomb

In this option, an article of clothing to be worn by the suicide bomber will be soaked in liquid explosive and allowed to dry. A jacket, shirt, or pants thus theoretically becomes a wearable bomb. This is fundamentally different than sewing explosives into an article of clothing because no bulky or paneled sections of clothing will be evident. An alert from US authorities during late 2003 which “...warned of terrorists using socks soaked in explosives and hung from a cord around a terrorist’s neck...” represents an example of concerns over this bomb use option.⁵¹ Issues of clothing flammability, toxicity to human skin, and its likely inability to detonate, make this bomb option highly improbable.

Medical Cast Bomb

This bomb placement option is one derived from the use of a medical arm or leg cast that would normally be placed over a broken limb.⁵² Either the plaster cast itself is the bomb,⁵³

with the explosive integrated inside the length and width of it, or the cast covers the bomb, which is composed of a thin-sheet explosive.⁵⁴ David Stone, then assistant secretary of Homeland Security, identified this threat coming through airport screening checkpoints in December 2004 as his greatest concern.⁵⁵ Thin-sheet explosives are typically utilized by terrorists in letter bombs but just as easily can be utilized inside or under other objects. A medical variant to the cast bomb is the thin back brace bomb. This has been noted by the Transportation Security Administration (TSA) as another potential threat with the explosives and a blasting cap potentially being placed within its lining.⁵⁶ Other medical variants would be bombs secreted in urine and colostomy bags.

External Belly Bomb

This option is primarily derived from using a plaster or plastic mold that mimics the contours of a woman in late term pregnancy.⁵⁷ Sub-categories of this option include simulating male beer bellies, muscular calves, more pronounced female breasts, a more masculine chest, or conceivably the hunchback effects of osteoporosis or a birth deformity with a mold or polyurathane bladder.⁵⁸ Synthetic silicone skin may or may not be a component of these molds in order to better disguise them. The intent is create an empty volume of space next to the human body, yet which appears to be part of the human body, that can be utilized for the placement of a bomb. Such a bomb would utilize either a solid or liquid explosive charge. Historical instances of this bomb placement option can be seen with the utilization of female suicide bombers, pretending to be pregnant, who detonated themselves as in the case of a Kurdistan Workers' Party (PKK) operative in Turkey in June 1996 and a Tamil Tigers operative in April 2006.⁵⁹

Prosthesis Bomb

This option for bomb placement was epitomized in the 1975 low budget movie *Death Race 2000* with the explosive prosthetic hand belonging to the car driver Frankenstein.⁶⁰ Drugs, money, knives, and pistols have been secretly cached in this manner. More exotic items found smuggled in a false leg include valuable iguanas and a small canister of CS gas.⁶¹ The CS gas canister incident is significant because it approximates the size of a small hand grenade. Both older style wooden legs and arms and newer ones made out of composite materials could be utilized for this bomb placement option. Basically, a void space needs to be created in the prosthesis in which to place the explosive device and that is relatively easy to accomplish.

Under Fat Roll Bomb

This bomb placement option is derived from utilizing significantly overweight individuals who may have enough belly fat to create a void large enough between the pelvis and the fat rolls to hide an explosive device. Drugs and firearms have both been found in the belly fat rolls of obese inmates in correctional facilities and criminals on the streets in the past.⁶² On one hand, security and police personnel do not like to check suspect fat rolls, because often skin rashes and lesions exist due to poor personal hygiene, however, the practice of hiding contraband and weapons under fat rolls has become so

prevalent that checking them has pretty much become standard procedure in screening operations.

Body Cavity Bomb

The general trend of the bomb getting closer and closer to the human body is taken to its extreme with the bomb being placed inside the human body. This placement option is conceptually derived from contraband smuggling through airports and into prisons—if illegal drugs are being carried inside the human body to escape screening and detection then internally carried explosive devices for terrorist use purposes should also conceivably be able to be carried. The second activity suggesting this placement option is the use of booby-trapped corpses in wars and insurgencies. Booby-trapping the corpses of soldiers—typically with the bomb placed under the corpse—is a well-known technique. These bombs are now being placed internally. In recent conflicts in Nepal, in 2005, a soldier’s body had an improvised explosive device placed within it (no postmortem was carried out and the bomb exploded during cremation) and, in Afghanistan in 2007, a news headline began with “Insurgents planting IEDs inside human corpses...”⁶³ This bomb placement option is thus simply the merging of internal body contraband smuggling by a living human being and the placement of an explosive device in the body cavity of a dead human being utilized as a booby trap

Of these six placement options, the body cavity bomb option is thought to be the only one that will be operationally viable in the future for terrorist utilization as a means of bomb delivery against a high value target. This is because all of the other options generate a higher level of risk of discovery during screening. Casts, prostheses, false body parts, and immense belly rolls, are all anomalies and therefore result in ‘red flags’ for screening personnel protecting high value targets. Even explosive liquid saturated clothing with fabric stiffness, discoloration, and the use of masking odors would present its own unique set of anomalies. Additionally, the explosive clothing bomb is probably not currently feasible, while the under fat roll bomb suffers from a lack of candidate personnel fulfilling the delivery criteria since very few terrorist operatives are that significantly overweight. Carrying the bomb in an internal body cavity effectively renders it invisible to security personnel and does not raise any ‘red flags’ that would single out the terrorist operative for further scrutiny. While certain operative behaviors or forms of non-visual sensing via machines or animals may still result in the detection of the body bomb, the probability of detection is significantly reduced.⁶⁴ Further, bomb construction protocols—such as the use of ‘clean rooms’ for operative cavity packing— can be implemented as a counter to screening measures that further ensure reduced probability of the body bomb being detected. These advantages make the body cavity bomb option far superior to the other competing terrorist bomb placement options analyzed.

Islamic Views on the Acceptability of Foreign Object Placement in Body Cavities⁶⁵

While the body cavity bomb option is superior to the other bomb placement options, this does not automatically mean that it can be utilized by terrorists, specifically devout and radicalized ones adhering to the tenets of Islam. Rather, a religious review was conducted to determine if any form of prohibition or ban exists in Islam for placing foreign objects in one's body cavities. From an Islamic jurist perspective, the *Quran* (the main religious text), the various *Hadiths* (narratives relating to Muhammad), and even specific *Fatwas* (an issued religious opinion) were consulted before undertaking such a determination.

A review of basic Islamic jurisprudence results in the identification of a number of prohibitions and allowances for placing foreign objects in body cavities derived from one's basic intent. Sexual relations and gratification in Islam, for instance, are bound by strict laws of moderation and religious conduct. As a result, foreign inanimate objects are not allowed to be inserted into the female or male body in order to derive sexual pleasure.⁶⁶ Issues of self-beautification, derived from recognition of 'what Allah provided an individual and thus made lawful', would thus prohibit breast and other forms of implants from being utilized to merely increase one's attractiveness. However, based on concepts of *Add-Darar yuzaal* (harm should be prevented), a married woman with undersized breasts who is being ignored by her husband would be considered an exception and would be allowed breast implants.⁶⁷ This same concept of preventing harm can also be applied to medical devices, such as artificial pacemakers, hearing devices, and metal hip joints, implanted in older and more affluent Muslims such as white collar professionals and Saudi royalty.

The status of implants in Islam gets a bit murkier with regard to issues of state security and counter-terrorism. A patent filing incident in Germany in which a Saudi national applied for a 'killer' microchip with GPS and poison release capabilities to real-time track, regulate the movements of, and if need be terminate the life of an implanted criminal was noted in the press in May 2009.⁶⁸ More standard GPS tracking devices, implanted into some foreign dignitaries as an anti-kidnapping measure, as well as smaller and less sophisticated RFID (radio frequency identification) implants, may have been utilized by select Saudi and other Islamic dignitaries. This sort of technology use by Islamic states, as it would be with all sovereign states, is a sensitive topic and as a result little to no information is publicly available. Such a practice also represents a gray legal area in Islamic jurisprudence though no specific religious guidance exists that makes it explicitly *haram* (forbidden).⁶⁹ The subject of body cavity implants, specifically those to be utilized as bombs by terrorists, also falls into a gray legal area with no rulings known to exist that would prohibit this practice. As long as the intent was not sexual gratification or self-beautification, fully functioning bombs, explosives, or bomb components can be theoretically placed inside the body of a Muslim. Quite possibly, this practice could be justified under the tenets of *Dar al-harb* (The House of War) and more classical interpretations of *jihad* (Holy War). These interpretations of Islamic jurisprudence have been used to legitimize the use of suicide bombers by Al Qaeda and other terrorist groups

in the past. They could just as easily be drawn upon in the creation of *Fatwas* promoting the future employment of body cavity bombs if required.

Body Cavity Bomb Placement Options

Precedent for the potential placement of bombs in body cavities is principally derived from narcotics and other forms of contraband smuggling. In addition, the modification of the human body with artistic and cosmetic implants, various surgical techniques, and actual instances of weapons being secreted inside body cavities has also been drawn upon. A target set approach to bomb placement will be taken with all conceivable payload options reviewed:

Non-Options

Existing body cavities that can be immediately disregarded for bomb placement are those critical to immediate human survival needs or if exploited as a payload option would cause extreme pain and discomfort to the payload carrier and thus result in ensuing behavioral clues that can be picked up by security screeners. For these reasons, blockage of the human airway from the mouth, down to and including the lungs, would be ruled out, as would utilization of the sinuses and the ear canals. The limited carry capacities of these latter two cavities would further preclude their use.

The Mouth

The mouth is of limited operational utility for bomb placement because of its small size, the need to keep the central airway open, and difficulty of hiding the payload (it would necessitate a bulge in the side of the mouth). While small tightly wrapped balloons of black tar heroin and other narcotics have been carried in this manner by drug dealers, with no resulting mouth bulge, such limited carrying capacity would make for too small of an amount of explosives being delivered to the target. Additional drawbacks are the limited amount of time such a small bomb could be kept in the mouth, the need to get face-to-face (literally check-to-check) with the intended target—presumably an important person in order to attempt to assassinate them—and space restraints on bomb detonation options. Historical reports of mouth bomb incidents include the suicide of anarchist Louis Lingg, who in 1887 held an explosive device in his mouth and detonated it while in jail to avoid execution and the Tucson, Arizona bank robber who in October 2005 claimed via a note to have a bomb in his duct taped shut mouth (he didn't) and subsequently had it searched by the mechanical arm of a bomb robot deployed by the local police department.⁷⁰ For high value targeting requirements, this bomb placement option is considered to be of little to no utility for terrorists and thus will be ruled out.

The Stomach (Upper Digestive Track)

The upper digestive track, principally the stomach, has traditionally been used to smuggle narcotics into the United States on flights originating from overseas. A drug mule, the human carrying the narcotics, will typically swallow numerous small packets of cocaine

or heroin wrapped in plastic or latex (usually condoms) to get through airport screening. Drug mules come in all sexes and ages and have included a 12-year old boy arrested in 2002 with 87 packets of heroin in his stomach and a single mother of six from Trinidad arrested in 2003 with 100 packets of cocaine in her stomach.⁷¹ This smuggling technique requires some training to get over the natural gag reflex of swallowing the packets, can make the mule nauseated, and can cause intense pain and even death if a packet were to burst.⁷² While the stomach could be used to carry a large payload using this smuggling method, with explosive material being substituted for narcotics in the packets, multiple individual packets are not ideal for bomb use because the main explosive charge is not formed into a dense mass required for proper detonation. Variants of the stomach bomb approach include gastric or even transgastric surgery procedures for bomb placement⁷³ and the initial smuggling of the explosives in the stomach and small intestines for later bomb assembly. A fictional scenario of surgical bomb placement using the stomach has recently been highlighted in the 2008 Batman film *The Dark Knight*. In that film the Joker blew up a police station by means of a cell-phone activated bomb sewn into an unwilling victim taken into custody.⁷⁴

The Rectum/Large Intestines (Lower Digestive Track)

The lower digestive track has long been labeled “The Prisoner’s Purse” because this is where criminals store contraband and improvised weapons. This method of hiding contraband is also used by mules to smuggle drugs into the US and to get drugs, money, and other items into jails and prisons during family visitations with inmates. Items related to explosive devices which have been discovered up the rectums of prisoners include shanks (sharpened pieces of metal or plastic), cell phones, and, in 2007 in a El Salvador jail, a V40 golf-ball sized hand grenade.⁷⁵ Rectum payloads can be of even larger size—after one briefing on body cavity bomb potentials a few years back, the author was provided with a photo of an x-ray of a Silly String can lodged in an individual’s rectum.⁷⁶ This can is about the same size as that of the E&E Suppository MK I escape kit. This waterproof kit dates back to the early OSS/CIA during World War II and was followed by the E&E Suppository MK II that was shorter yet thicker in diameter. The kits contained a saw, file, knife blades, drill and reamers with the second kit issued with surgical lubricating jelly for easier insertion.⁷⁷ The initial kit description states that “Once one becomes acquainted with the item, it is not uncomfortable to carry...”⁷⁸ which suggests that sizeable explosive payloads can easily be inserted into the rectum and that their existence will not be betrayed by an abnormal gait or discomfort on the part of a potential body cavity bomber. A variant of the rectum bomb, the stoma bomb, is also hypothesized and would result in the bomb hidden inside the end of the intestine sewn into the hip and used for elimination of waste by colostomy patients.

Vaginal Cavity (& Uterus)

Placing an explosive device in the vaginal cavity is also conceptually derived from criminals storing and smuggling drugs, cell phones, money, and weapons. Good-sized payloads can be achieved given the fact that in one smuggling case obstetric forceps had to be utilized to remove a drug container tightly packed into the vagina of the carrier.⁷⁹

Further, the OSS/CIA E&E Suppository kits could also be carried in this manner. In jail and prison settings, a replica of a small pistol (in actuality a cigarette lighter) and a M67 hand grenade have also been discovered in vaginal cavities.⁸⁰ In the case of the grenade, it was said to be fully functional and was being smuggled into a Salvadoran prison, along with some marijuana, in a 10 inch long by 4 inch wide cylinder.⁸¹ The uterus must also now be considered a potential payload area for an explosive device. Uterine packing methods could conceivably be based on annual exams, in which the cervix is widened to gain access to the uterus or, in an even more bizarre scenario, the aborting of a fetus so that a stretched out uterus could be exploited for bomb implantation. The second option raises a whole host of Islamic religious issues and prohibitions because a “fetus martyr” would be extremely difficult for Al Qaeda to justify.⁸² Still, concerning the 2006 London liquid bomb plot tied to Al Qaeda:

British-born Ali, of Walthamstow, was said to be inspired by the July 7 bombers and Osama bin Laden and considered taking his baby son on his suicide mission.⁸³

Additionally, in 2007, a pregnant Palestinian woman and mother of eight belonging to Islamic Jihad was captured while en route to be given explosives for a suicide bombing she was to conduct in Israel.⁸⁴ Some form of operational precedent for baby and fetus martyrs then may be emerging and logically would suggest that the children of Al Qaeda members could someday be indoctrinated or possibly coerced into carrying body cavity bombs.

The Subcutaneous Fat Layer

This bomb placement method is inspired by both body art implants and plastic surgery. The bomb would be implanted directly under the subcutaneous fat layer as has been done along the breast bone with brass knuckles and along the arm with ball bearings and marbles for body modification aficionados.⁸⁵ In this instance, either a tubular explosive charge or flexible sheet explosive can be implanted. For sheet explosives, a payload of a twelve-inch by six-inch area (seventy two square inches) can easily be achieved for an implant along the stomach section of a female with an implant scar, which could be disguised to look like a caesarean section.⁸⁶ Tissue expansion devices and implants for cheeks, breasts, buttocks, and calves utilized in plastic surgery procedures also have bomb implant potentials. In these instances, the inert gels in these devices and implants would be substituted with explosive liquids, gels, or solids. Debates undoubtedly would exist among bomb technicians and security experts as to whether these and other types of explosive implants could be made to properly function.

Deep Internal (Make New Cavities)

This option is derived from medical procedures for fat removal (liposuction) and general surgery. Some overlap also exists with surgical bomb implants into the stomach (gastric surgery) and uterine cavities discussed earlier. Drug smuggling in animals and humans has taken place where drugs were surgically implanted. This bomb placement option

would substitute an explosive payload for a drug payload. In the case of animal smuggling, a total of three kilograms of liquid heroin were stitched into the bellies of six puppies in 2004 by a veterinarian in Colombia.⁸⁷ This was by no means a unique incident. In 1996, an English sheep dog—later named “Cokey” by the Customs inspector who saved him— was interdicted at JFK airport in New York with ten cocaine-filled balloons sewn into his abdomen.⁸⁸ Drugs have also been smuggled by humans by means of painful surgical implants into the stomach, abdomen, and thighs.⁸⁹

The best options for terrorist employment are thus the rectum and vaginal cavity for non-surgical bomb placement and the subcutaneous fat layer and deep internal for surgical bomb placement. The packing of the uterine cavity with a bomb after the removal of an aborted fetus, while gruesome, has to also now be considered a potential surgical payload option. However, surgical bomb placement requires moderate to high levels of medical expertise that creates a barrier to entry for Al Qaeda for it necessitates the use of support personnel with veterinary and/or actual medical doctor (MD) surgical training. As before noted, the mouth is of extremely limited value and the stomach option, based on contraband swallowing, is problematic because the explosive payload would be spread out in numerous individual condom size packages which would likely be detrimental to achieving the proper mass density needed for an explosion to take place. Still, sympathetic detonation dynamics would come into play and the use of plastic explosives in this manner cannot be fully ruled out.

Bomb Components, Assembly, and Detonation Issues

All because it has been shown that a bomb (or explosives) can be placed inside the human body does not necessarily mean that it can *a priori* be detonated. US and other governmental officials and other skeptics may readily question whether bombs can actually be detonated inside human bodies. Some of these concerns are valid while others may be meant to obscure screening, detection, and security vulnerabilities in airports and in other high value venues. Historically, it is recognized that bombs have been detonated while underwater (sea mines) and also underground (land mines). Both of these surrounding mediums—water and soil—have mass densities either about equal to humans (which are about 60% water) or slightly greater for compacted earth.⁹⁰ Bombs have also exploded while functioning in a booby-trap role while placed under or inside animal and human corpses. An external oxygen source is not required to detonate a bomb because oxidizing materials, which give off oxygen as they react with other substances, especially Class 4 oxidizers, such as hydrogen peroxide, which themselves undergo an explosive reaction when subjected to heat, shock, or friction can be utilized.⁹¹ Therefore, the suggestion that bombs are unable to detonate while inside the human body is a fallacy.

What is accurate, however, is that the human body, like water and soil, will partially absorb the force of an explosion-taking place inside of it. An omni-directional explosion (one like an expanding sphere) will see much of its energy absorbed as the human body breaks up around it. Still, the blast will attempt to travel via the path of least resistance. In the case of device placed in the lower colon, for example, more of the force

of the explosion will be directed downward. Both the military and even terrorists have long recognized such basic blast dynamics. In order to create better explosive energy use efficiencies, and hence lethality, directionality of a blast can be created by channeling it by means of shaping the resulting blast or shaping the explosive charge to begin with. The explosive backpack device used in the July 1996 US Centennial Olympic Park bombing incorporated a metal plate behind it to give it some directionality in order to create a killing zone.⁹² In operations in Iraq, insurgents in 2007 increasingly relied upon explosively formed projectiles (EFPs)—basically a shaped charge propelling a metal projectile which becomes a liquid molten stream— to target and destroy US armored fighting vehicles (AFVs).⁹³

We can expect that actual body cavity bombs will be composed of the following components: some sort of waterproof membrane or skin, a primary charge, a booster charge to set off the primary charge (typically required), blast shaping (optional), and a detonation method. No fragmentation will be utilized—metal or non-metal (such as ceramics) bearings or bolts—in order to either keep metal content of the device to a minimum so as to avoid metal detectors and/or to maximize explosive yield. A waterproof, and in some instances digestive proof, membrane or skin around the explosive device is required to not only act as a barrier with bodily fluids (explosives are highly toxic) but to maintain the mass density of the device. The primary charge can be a military grade explosive (such as Semtex or C-4), a commercial grade explosive or component (such as dynamite or nitroglycerin), or an improvised explosive (many of which are peroxide-based). Typically a booster charge, such as PETN (pentaerythritol tetranitrate), is required to set off a main charge like TATP (triacetone triperoxide). The same booster requirements also exist for stable military explosives such as Semtex. Booster charges may be primitive and improvised in manner or can be contained in actual military or commercial blasting caps or detonators. The blast shaping component is the use of shaped charges or some sort of hard plastic backing placed behind the device to create directionality of the blast. This is an optional component, will result in heightened device lethality, and one expected in later iterations of body cavity bombs as their use matures.

In some ways, the detonation method is of greatest interest because this has proven to be the most difficult component for terrorists to overcome. Both of the airliner bombing plots involving Richard Reid and Umar Farouk Abdulmutallab failed at this juncture. Four basic body cavity bomb detonation scenarios are projected:

- *Self-contained detonation.* In this scenario, some sort of internal timer, time delay, or threshold switch is utilized to trigger the bomb to detonate. This could range from the timer on a cell phone going off, a global positioning system (GPS) register activating a subscriber identity module (SIM) card or radio frequency identification (RFID) tag, a paraffin barrier between binary chemicals being dissolved, or the setting of an altitude switch being met.⁹⁴ A false pacemaker with a countdown time that mimics a legitimate pacemaker, implanted in the bomber could also be utilized for such purposes.

- *External non-intrusive detonation.* This method of bomb detonation relies upon an external non-intrusive device being utilized to set off the explosion. Examples would be calling or texting the detonator implanted with the device, the bomber striking his or her abdomen or side with their fist (in order to crush an implanted glass vial containing binary agents), or externally running a magnet over the device (for detonation by means of spark generation). Some sort of security procedure is typically required for the use of cell phone detonated bombs which can be pre-detonated due to a call to the wrong number or from a telephone solicitation.

- *External intrusive detonation.* This scenario is derived from taking an external object and physically making it come in contact with the body cavity bomb for detonation purposes. Examples would be injecting a syringe of caustic liquids directly into the bomb itself by means of a needle or attaching the wires from an external energy source, such as a cell phone or hand held gaming device, to a blasting cap. The later method could interface with wires from the bomb implanted just under the skin that could be cut open in the lavatory of an airliner.

- *External assembly and detonation.* The final scenario would combine bomb components (primary explosives, booster charges, and/or blasting caps) hidden inside the body—via the rectum or the vagina—with external power sources carried by the bomber. The final assembly and detonation of the bomb would then be undertaken in an airliner lavatory or in the bathroom stall of a secure facility such as a US embassy or a nuclear power plant.

Like more conventional suicide bombs, the components and functioning of body cavity bombs are a matter of tradeoffs between safety, reliability, ease of use, how detectable they are, their explosive yield, and ultimately their lethality. When electronic components and military explosives are utilized in these bombs, many of their functioning attributes will increase while at the same time making those devices much easier to detect. As has already been seen, explosive device components and their subsequent detonation methods utilized by terrorists is at this point limited only by their lack of imagination and ingenuity.⁹⁵

Putty, Cheese, and the Fadhel Al-Maliki Incident

The period between the fall of 2006 and the summer of 2007 were busy times for security screeners with heightened concerns over numerous terrorist ‘dry runs’ taking place in US airports. These concerns culminated with a TSA Transportation Intelligence Gazette document entitled (*U*) *Incidents at U.S. Airports May Suggest Possible Pre-Attack Probing* being distributed on 20 July 2007. This U//FOUO (For Official Use Only) document was leaked to the press and subsequently posted on the MSNBC news site.⁹⁶ It chronicled the following then recent suspicious incidents:

- (U//FOUO) 5 July 2007, San Diego, CA— A U.S. Person’s (USPER) checked baggage contained two icepacks covered in duct tape. The icepacks had clay inside of them rather than the normal blue gel.

- (U//FOUO) 4 June 2007, Milwaukee, WI— The carry-on baggage of a USPER contained several items resembling IED components, such as a wire coil wrapped around a possible initiator, an electrical switch, batteries, three tubes, and two blocks of cheese.
- (U//FOUO) 8 November 2006, Houston, TX— A USPER's checked baggage contained a plastic bag with a 9-volt battery, wires, a block of brown clay-like minerals, and pipes.
- (U//FOUO) 16 September 2006, Baltimore, MD— The checked baggage of a couple contained a plastic bag with a block of processed cheese taped to another plastic bag holding a cellular phone charger.⁹⁷

Cheese is a favored component of these dry runs because it "...has a consistency comparable to some explosive materials"⁹⁸ and, if the dry run is detected, no laws have been broken by combining cheese or putty with wires, batteries, and other IED-like components. While the above 2007 San Diego incident was later determined not to be an actual probe, this is only a representative listing of a larger number of I&W (indications and warnings) events taking place.⁹⁹ Further, such events also included airport surveillance and the testing of passenger security regulations on domestic US flights by what are presumed to be peripheral and affinity elements of the Al Qaeda network.¹⁰⁰

Of all of these incidents, the one that holds the most interest with regard to body cavity bomb use potentials is the one pertaining to Fadhel al-Maliki, a 35-year old Iraqi national living in Atlantic City, NJ.¹⁰¹ Al-Maliki was a Philadelphia bound passenger traveling through screening at Los Angeles International Airport (LAX) on the morning of 6 March 2007. His bizarre behavior, he was nervous and sweating, was noticed by an airport screener and he underwent secondary screening that set off a metal detector. He initially refused to identify the objects that he had hidden but eventually, and with much prompting by federal agents, he finally disclosed that he was carrying items inside his rectum. News reports of what these items were are conflicting but fall into three general categories of items being present:

- Wires or thin wire filament
- Magnet or rock
- Chewing gum or putty

No mention of a container or plastic wrapper was mentioned in the news reports but it is assumed these items were secreted into the body cavity inside a wrapper or a waterproof baggie of some sort. The incident resulted in not only LAX security screeners (TSA) and airport police being involved but also a response by the local bomb squad, HAZMAT (hazardous materials) technicians, and the FBI because of concerns that the hidden items might be bomb components. Al-Maliki stated that the reason he had the items inside his rectum were for "therapeutic reasons" and to "alleviate [or relieve] stress."¹⁰² The rock was said to be from another planet.¹⁰³ It can be assumed that standard

law enforcement policy would be to test the secreted contents for explosive and other illicit residues and that none were found. Al-Maliki's luggage was also checked, it had in fact been loaded onto his flight and the craft was diverted to Las Vegas so that it could be immediately screened, and turned up nothing hazardous or illegal.¹⁰⁴ Ultimately, it was determined that al-Maliki had broken no laws, no matter how suspicious or bizarre his actions, and he was not charged for any crimes. He was, however, turned over to Immigration and Customs Enforcement (ICE) because, although he had been inside the US since 1994, either the status of or information pertaining to his green card were in question.¹⁰⁵

Troubling aspects of this incident which immediately come to mind pertain to its timing with the other national airport probes then taking place, the types of items involved which are IED-like in nature (if the rock-like object was a magnet it can be used for spark detonation of an explosive), and the location of the items (in the rectum). An additional item of concern is that the venue was LAX. Al Qaeda first tried to bomb this airport in December 1999 in the 'Millennium Bomber' case and once this terrorist group has set its sights on a high profile target it will remain on its targeting list as took place with the World Trade Towers following the unsuccessful February 1993 bombing incident. Further, not only do we have an Iraqi national involved in the incident with questionable immigration status but he had in the past served time in jail for criminal trespassing and was also arrested on suspicion of possession of a destructive device (with charges later dropped).¹⁰⁶ To this should be added the bizarre behavior involved, reminiscent of that of the shoe bomber Richard Reid, and the improbable reasons for secreting the IED-like items. Additionally, if al-Maliki is a devout Muslim, the secretion answers given to federal agents violate the rules of gratification and moderation in Islam pertaining to foreign inanimate objects being inserted inside the body in order to derive (sexual) pleasure, or for that matter, to feel better. In one sense, such a reply would represent an elegant culturally-derived insult directed at unsophisticated federal agents none the wiser to its blunt "F... you" connotations. If this were not enough, the individual in question had a large number of \$100.00 bills on him at the time of his detainment and, according to local sources, his activities while in Los Angeles for the day or two he was present were not accounted for.

Once again, while al-Maliki was cleared of any criminal actions for this incident and then turned over to ICE for some sort of immigration issue—with his current status unknown¹⁰⁷ — many elements of this saga trigger classic indications and warnings (I&W) criteria.

Al Qaeda Use Validation: The Abdullah Al-Asiri Incident

A little over two and a half years after the al-Maliki incident in Los Angeles, the first recorded use of a body cavity bomb took place. On August 28, 2009, an assassination attempt was made against Saudi Prince Mohammed bin Nayef at his private residence in Jeddah, Saudi Arabia by the 23 or 24 year old Al Qaeda operative Abdullah al-Asiri.¹⁰⁸ The Saudi Prince is head of the Kingdom's counter-terrorism operations and has been highly successful in the past in convincing over two-dozen Al Qaeda members to defect

from that terrorist organization with promises of amnesty and rehabilitation. This Saudi program had become a direct threat to Al Qaeda in that area of operations and it was determined that the Prince would be targeted for assassination.

A plan was hatched in Yemen, which has a strong Al Qaeda presence, to assassinate Prince bin Nayef in a face-to-face meeting with a suicide bomber carrying a hidden bomb. Precedent for this type of assassin was that of the killing of anti-Taliban leader Ahmed Shah Masood in September 2001. Abdullah al-Asiri, a most wanted Al Qaeda fugitive from Saudi Arabia, volunteered to bait the trap and engage in the martyrdom operation. Representatives of the Prince were contacted during Ramadan, which is a time of repentance in Islam, with the story that al-Asiri had decided to give himself up—but only to the Prince directly— in return for amnesty and rehabilitation. Not only would this be another coup for the Prince but al-Asiri said that upon his successful surrender he would convince other Al Qaeda members in Yemen to do the same. The Prince accepted the offer and, as a result, al-Asiri traveled to the Yemeni-Saudi border in order to be escorted by Saudi security personnel to the private residence of bin Nayef to formally turn himself in. Al-Asiri traveled with the Prince's private security detail for 30 hours and took two flights, one commercial and one aboard the Prince's own jet, prior to the meeting. Event reports then get conflicting in terms of what security precautions were undertaken at the airports traveled through. Al-Asiri either traveled through one, two, or no metal detectors depending on the airport protocols followed at Narjan and Jeddah airports¹⁰⁹ — although, if a commercial flight was taken, it would be almost inconceivable that he did not walk through at least one metal detector portal and was potentially even frisked by airport security.¹¹⁰ Basic Saudi screening policies are that “Individuals refusing to be searched will be detained, deported and black listed by the Saudi Arabian government.”¹¹¹

What is not uncertain is that when Saudi state security initially met up with al-Asiri at the Yemense border, standing protocols for executive protection would dictate that he would be both frisked and wanded with a hand held metal detector. A detailed body search for weapons would have entailed either a cursory pat down of the genitals, extending back to the buttocks, or a strip search leading to a basic cavity search of the rectum since a plastic shank could have been secreted in this manner. However, since al-Asiri was traveling much like a guest under the pretext of surrendering himself to bin Nayef, these more intrusive searches would have been quite rightly viewed as an affront to his personal honor and right to modesty under Islamic law. This leaves open the possibility that the bomb being carried by al-Asiri was either taped between his buttocks or situated underneath or behind his genitals, as in the later case of the Abdulmutallab's Underwear Bomb on the Christmas airliner flight deployed four months later. The between-the-buttocks option is not viable because it would have thrown off al-Asiri's gait, and each time he sat down, a device so planted would likely shift in position. The question then arises why the metal content of the bomb, if it indeed contained metal for detonation purposes, was not detected if the bomb was externally located by the genitalia. The probability of metal detection would be slightly lower if the bomb was internally placed. Other possible explanations were that metal detector calibrations were off, the

bomb contained very low metal content, or it used a detonation method requiring no metal content.

When al-Asiri arrived at the entry point into the Prince's private residence, it is unknown if its security perimeter included passing through another set of metal detectors but this is likely the case.¹¹² The health of al-Asiri is unknown but it would make sense for him to stop or slow down his digestive process so that food waste, and any other foreign items present, would not pass through his intestinal track. Al-Asiri could partially pull this off since it is customary during the month of Ramadan not to partake in meals during daily fasting. While a devout Muslim is allowed to eat after the sun goes down, he could have feigned illness over being nervous at the meeting with the Prince. To further ensure such a digestive track shutdown takes place, colonics can be taken beforehand to flush out the stomach and intestinal track and medication can also be taken to inhibit digestion and constipate him.

Upon meeting the Prince in his residence, the two made small talk and at some point al-Asiri proceeded to call his confederates in Yemen supposedly to convince them that all was well and that they too should surrender to the Saudi authorities. It was initially unclear if the two were standing next to each other as the Al Qaeda later video suggests or if they were sitting either in chairs or on mats near each other. The reason that they may have initially sat together, later confirmed by forensic blast evidence, is that in their earlier telephone conversation al-Asiri said "I need to meet you to tell you the whole story" to which the Prince replied "If you come I will sit with you and both of us can give whatever he has to his companion."¹¹³ It was during this conversation with the two by a window, taped by Al Qaeda and later release in the propaganda tape *The Grandchildren of Muhammad ibn Maslamah*,¹¹⁴ that al-Asiri uttered the exact same phrase twice in Arabic— "Your vision shall come true, Allah willing" (English translation).¹¹⁵ The phone was then handed to the Prince and al-Asiri literally exploded 14 seconds later. While the phrases were uttered by al-Asiri an audible beep can be heard which, according to CBS news explosives experts have said, indicated it was a probable text message activating a bomb inside of al-Asiri.¹¹⁶ The reason for using a two phrase sequence was to ensure that pre-detonation of the bomb did not take place because of a single misunderstood keyword uttered from al-Asiri or a random call to the cell phone receiver attached to the bomb.

Surprisingly, the Prince was only slightly injured in the suicide bombing and, in posed after incident photos at some sort of function, is shown to have only some bandaged fingers. Both video and still photos of the bombing scene have been released and as expected it is a mess, with blast damage and parts of al-Asiri strewn about.¹¹⁷ Most of the blast was directed downward, with the lower half of al-Asiri's body disintegrating and a sizable hole left in the concrete palace floor. Part of a foot is on the ground and a portion of one of al-Asiri's arms is visibly blown into a hole in the ceiling. The seat of the explosion appears to be in the lower bodily region with the lower digestive track blown out along with the upper thighs, buttocks, and genitalia. Still, because of the extreme difficulty in determining just what transpired and contradictory accounts of the event, a professional forensic analysis of the actual bomb blast photos was initiated by the author to help ascertain the truth behind the device utilized and the context in which the actual

bombing took place. David A. Kuhn, a respected standoff weaponry and IED specialist, was contacted in March 2010 to conduct such an analysis and these are his findings:

Post Blast Analysis

This analysis is based upon close examination of the photographs that were taken at the incident scene. It will provide both post blast analysis and blast pathology to the extent that the photographic view and resolution allows.

The explosive package appears to have been located within the rectum of the bomber. Based upon blast pathology and the damage signature present within the room, the total non-confined explosive weight (other than body confinement) appears to be less than .25 lbs. (115.39 grams) TNT equivalency in weight. The actual explosive may have been plastic or PETN in paste form sealed within plastic to prevent toxicity. Two of the available photographs of Abdullah Asieri [al-Asiri] have been extracted by various sources from video footage. Both of these show Asieri [al-Asiri] in front of a light canvas background. In one, a Pyrex separatory funnel is visible on a laboratory support. The other one shows him holding an RFAS F-1 fragmentation hand grenade. Based upon all of the photographs examined, there is no evidence that a grenade body, blast type or fragmentation, was involved in the blast. All views of the affected walls and ceiling sections show no evidence of shrapnel or indications of a metal casement. Additionally, the approximate explosive filler weight of the F-1 is 60-grams of TNT, less than half of the total explosive weight believed to be involved.

Photographs of Wall Area and Window

The blast damage indicates that the bomber was in a sitting position on the mat / cushions present when the explosive detonated. These cushions appear to have attenuated both the downward force of the blast and total level of reflected blast pressure. The bomber's upper torso was approximately 2.5 – 3-feet from the wall in front of the window. His back was facing the wall when the explosive detonated. Intense heat close to the epicenter singed the adjacent drapery. The bomber's feet were positioned under or adjacent to the buttocks. The blast propagated through the abdominal area and through the lower back, severing the torso. A partial severed base of the left foot landed some distance from the epicenter.

Photographs of the Ceiling and Adjacent Walls

The elongated hole that is present in the ceiling area near the recessed lighting shows a partial view of the bombers right hand. The size of the opening indicates that the hand had approximately 6-inches of the right

forearm attached when it entered the ceiling. Blood and tissue distribution on the crown molding perpendicular to the windows are indicative of the velocity of impact. The flexible metal conduit visible in the recess may have retarded the impact causing the hand / forearm to come to rest at the edge of the opening.

Of note is the immediate damage control attempt by Saudi state security to limit the impact and implications of this assassination attempt. A body cavity bomb, it was said, could not have been utilized because of the following reasons:

- A flash of light was evident when the bomb detonated so the bomb had to be hidden in his underwear.
- The explosive used is highly toxic to humans so it could not have been placed in his rectum or it would have poisoned him.
- It would be difficult to detonate a bomb placed inside the human body.
- A chemical fuse was thought to possibly be utilized to detonate the bomb which would have required its external placement.¹¹⁸

These insights provided by a Saudi government official close to the investigation are highly suspect because each one makes little sense.¹¹⁹ First, a flash of light is a component of the detonation of a bomb and, since the lower half of al-Asiri's body literally blew apart, any light and heat generated would escape the confines of the body. Second, like contraband, a cavity bomb would be placed in a waterproof membrane like an animal gut or plastic so explosive toxicity concerns are not an issue.¹²⁰ Third, bombs have been detonated both under and in human and animal carcasses, and also under the soil and in the ocean, so this is less problematic than it sounds. Fourth, if a chemical fuse was utilized, such as a syringe injector, then al-Asiri had to have kept it hidden for 30 hours from Saudi security and injected a primary bomb hidden under or behind his testicles while being in close proximity to the Prince. Additionally, al-Asiri's phone call to his Al Qaeda confederates in Yemen with a coded signal thus makes absolutely no sense.

To be fair, Al Qaeda, while claiming an internal bomb, is also engaging in disinformation concerning this operation and this can be seen in the matrydom video posted on Jihadi websites and even on YouTube. That video even contained a slick computer animated sequence of how the bombing was purported to take place.¹²¹ Still, in that video, narrated in Arabic with no full open source translation currently existing, al-Asiri is shown to hold up what is purported to be the actual bomb he will carry inside himself. It looks like an old Soviet F-1 defensive hand grenade (which resembles the World War II US Mk-II pineapple grenade) which contains so much metal content that it would have been easily detected by metal detectors, even badly calibrated ones, if it had been placed inside of his body.¹²² Further, such a grenade creates an immediate deadly shrapnel kill zone and only contains about half of the TNT equivalency which is

inconsistent with the light injuries suffered by the Prince (he likely would have been severely injured or killed), lack of shrapnel penetration holes in the walls, and the larger than would be expected downward blast damage to the floor of the room per the Kuhn analysis. Also, in the animation segment of the Al Qaeda video, al-Asiri and the Prince are both standing next to each other which is inaccurate— al-Asiri was sitting on a mat or cushion per the forensic evidence.

The most rational explanation, confirmed by David A. Kuhn's analysis of the bombing, is thus that Al Qaeda utilized a body cavity bomb. Further, it was quite possible inserted deep into al-Asiri's rectum as a countermeasure to a rectal security exam. PETN, or possibly plastic, would be the logical explosive of choice and it would have been secreted with a very low metal content cell phone detonator system in either a waterproof membrane or case. While this explanation can be countered with one then suggesting that al-Asiri utilized the exact same form of bomb under or behind his genitals as in the Christmas day bombing, as has been forwarded by Saudi security and other interests, it is contrary to what we know of the circumstances and to the forensic blast evidence.¹²³

Countermeasures and Strategic Use Implications

Body cavity bomb countermeasures, given the August 2009 assassination attempt on Saudi Prince Mohammed bin Nayef should now be of intense international and media interest, but this is simply not the case. That incident has been successfully suppressed and now superseded by the headline grabbing Umar Farouk Abdulmutallab underwear bombing incident which took place four months later.¹²⁴ As an outcome, a new policy and campaign of placing external body scanning machines in US and Western European airports is now taking place. Initially 150 of these machines were planned to be installed in the US per news reports as of October 2009 but, after the Christmas Day bombing attempt, that number had grown to about 1,000 machines to be purchased in total by the end of 2011.¹²⁵ Heathrow and Manchester airports in England and Schiphol airport in Holland will also be getting these machines as they begin to proliferate overseas.¹²⁶ These backscatter x-ray machines in actuality utilize low-intensity millimeter waves to obtain an image of the human body and items concealed under clothing. Detailed and computer rendered "cartoon like images", which protect passenger privacy via an algorithm, can be created in order to detect weapons, contraband, and most importantly bombs next to the human body. Both two-dimensional and more sophisticated three-dimensional versions of these machines exist. Such machines are thought to be the perfect countermeasure for bombs placed inside bras under female breasts and next to the genitalia of humans, though placing a bomb directly behind the male testicles may still result in a fair probability of defeating some of these machines.¹²⁷ The millimeter waves utilized only penetrate about a centimeter into human skin so the bones of the skull and objects directly implanted under the skin will be detected by these scans. Thus sub-dermal placed sheet explosives may or may not be detected with these scanners.

These scanners have touched off wide ranging debates over US and Western individual privacy concerns and also religious rights to modesty under Islamic law.

Alarms over ‘virtual strip searches,’ outcry over images of naked children and violation of child pornography laws, challenges by the American Civil Liberties Union (ACLU), and at least one instance of a film star’s naked images being printed out and circulated by airport staff at Heathrow have already taken place.¹²⁸ From the Islamic community, a Fatwa was issued in February 2010 by the Fiqh Council of North America that going through such scanners would violate Islamic law.¹²⁹ This was followed in March 2010 by two Muslim women at Manchester airport selected at random for screening who refused to be scanned and thus forfeited their £400 airfares to Pakistan.¹³⁰ These new issues are now piggybacking on even earlier screening tensions between Islamic law, which does not allow Muslims to be touched by ‘unclean animals’, and the Western use of bomb detection dogs to sniff them.¹³¹

Still, the worst thing about this present security effort is its overtly being orchestrated to deter all future underwear bombing attempts. As a result, Al Qaeda is being forced to give up on this mode of attack prematurely and pushed forward in a cycle of compressed co-evolutionary response. The outcome will be the abandonment of next to the body bomb placement options, such as those in underwear, far sooner than Al Qaeda would have naturally done so. While gaining the means to quietly detect and interdict such bombs is crucial, the TSA is not thinking strategically and is instead promoting a policy of absolute deterrence to one threat while not considering the far worse threat that will emerge as an unintended consequence of their open declaratory policy. TSA is unfortunately focusing on band-aid fixes, immediate battles, and positive press when instead it should be looking at the larger context of the suicide bomb evolutionary process and the necessary strategies involved to better manage, and if possible de-evolve, some of its future threat potentials.¹³²

The security dilemma that we now find ourselves in is that no reliable detection method exists to scan for body cavity suicide bombs. In addition to the standard metal detectors and body and liquid scanners now being fielded, explosive trace detection (ETD) machines and chemical spray detectors, which can test luggage and be applied to a passengers hands respectively, have or are also being deployed.¹³³ None of these sensing technologies can peer inside the human body and at best may pick up on sloppy terrorist tradecraft such as a body cavity bomber having his or her hand contaminated with urea nitrate or the use of a high metal content internal bomb. While biometric identifiers based on gait, pupil response, or facial expression are being discussed, they are still in their infancy and are not any more deployable to meet this new threat than diffraction-enhanced X-ray imaging (DEXI) or ground-penetrating radar technologies which show great promise in eventually being able to provide us with the interior body scanning capability so urgently needed.¹³⁴

The strategic use implications of body cavity suicide bombs, specifically those targeting commercial airliners, is that their use may now very well represent a “holy-grail” (equivalent) attack methodology for Al Qaeda. Since at least 1994, before the ill-fated Bojinka plot was uncovered, this group has been looking to carry out sustained and successful mass attacks on or relating to commercial airliners. The reason for this focus is that any form of commercial airliner attack makes major headlines, and even more

importantly, if sustained attacks on them can somehow be carried out they will cause severe economic disruption for the US and the rest of the Western World. This pattern of interest is evident in the January 1995 plot (using liquid explosives), the September 2001 attack (using box cutters), the December 2001 attempt (explosives in shoes), the successful August 2004 attacks (probable bra bombs), the August 2006 London plot (using liquid explosives), and the December 2009 attempt (using explosives sewn in underwear). With both success (9-11 and August 2004) and failure has come the enactment of Western countermeasures such as allowing no box-cutters or other sharp objects carried on flights, the scanning of shoes for explosives, breast bomb pat downs, the scanning of liquids for explosives and limitations on their quantities allowed on aircraft, and now the eventual placement of over 1,000 body scanning machines in airports in order to detect bombs hidden next to the human body.

Body cavity suicide bombs offer Al Qaeda an attack methodology with two immense potentials. First, it allows commercial airliners to be attacked successfully with improvised explosive devices (IEDs) smuggled directly into these aircraft by Al Qaeda operatives posing as passengers. Second, unlike the earlier plots and actual attempts on these airliners, the day after the attack scenario is different. No easy countermeasure such as removing shoes for scanning or taking less liquid onto an aircraft exists. Our security scanning and detection technologies are not presently mature enough to detect such bombs cleverly hidden within human body cavities. As a result, we have now entered a very dangerous window of vulnerability with regard to body cavity suicide bombs utilized against high value targets such as commercial aircraft but also against similar targets such as heads of state and other very important persons (VIPs). This window of vulnerability can be partially closed by means of traditional and successful counter-terrorism methods, such as the use interrogation-like techniques applied to passengers and being cognizant of attacker behaviors. Ultimately, however, it is going to require some sort of reliable and medically safe form of body cavity imaging of human beings, in addition to exterior body scans, that is quick enough to make it economically feasible in airport security settings with their potentially long passenger queues. Until the future fielding of such advanced scanning devices, we can now expect to be attacked individually, and just as likely attacked in clusters, by Al Qaeda operatives carrying body cavity suicide bombs inside of themselves on commercial airliners. This does not mean that such attacks will always be guaranteed successes — we may still be alerted to some of the internal bombs during the screening process and initiating a successful detonation is still difficult. While much of this paper and its final analysis may be reminiscent of science fiction, it also accurately describes evolving patterns of suicide bomb use and the new realities of terrorism that now exist in the second decade of the 21st century.

Endnotes

1. This work is challenging to both research and write because at its basis is an open source early warning PowerPoint presentation by the author concerning body cavity suicide bomb (BCSB) potentials initially provided to law enforcement and governmental entities between September 2006 and August 2008 on a non-public disclosure basis. The intent of this very detailed presentation, which underwent seven iterations during this time period with much, and at times very vocal, audience input, was to provide these US entities time to prepare for a specific form of projected terrorist threat. These projections became a reality in August 2009 with the first known use of a body cavity bomb by an Al Qaeda operative. Additional presentations to law enforcement, and a DHS academic center of excellence, were then made in the October 2009 to February 2010 period validating the initial body cavity suicide bomb use projections. While no detailed public disclosure was made concerning the threat addressed in this presentation prior to an actual Al Qaeda operation being conducted— such detailed publication was deemed irresponsible— this open source research is now being published in its entirety ‘since the cat is literally out of the bag’ and widely discussed on the internet. The difficulty that now exists is keeping the research and source time lines accurate while at the same time publishing a comprehensive and scholarly paper with the addition of new information and insights.

2. It is the contention of the author that terrorism is a criminal form of warfighting engaged in by non-state groups and that it should be analyzed from such a perspective. This is a different orientation than that taken by many terrorism scholars who focus on terrorism as a unique form of political violence with differing analytical requirements. Even given differences, it is agreed that body cavity suicide bomb use against high value targets is most dangerous when it is employed to generate terror. This perception is in line with the major works in this field of study that, ultimately, the main mission of terrorists is to terrorize civilian populations.

3. These military traditions were summarized in Robert J. Bunker and John P. Sullivan, *Suicide Bombings in Operation Iraqi Freedom*. Land Warfare Paper 46W. Arlington, VA: Institute of Land Warfare, Association of the US Army, September 2004: 1-4.

4. Early US examples include the use of the Confederate *CSS H. L. Hunley* submarine, which utilized a spar torpedo to destroy the sloop *USS Housatonic*, and the Union mining and detonation of a section of the Confederate defenses of Petersburg (known as the Battle of the Crater), both of which took place in 1864. For World War I examples of explosive mining operations, see Barrie Alexander, *War Underground*. London: Frederick Muller, 1962.

5. The assassination of Czar Alexander II of Russia in St. Petersburg by the Polish Anarchist Ignacy Hryniewiecki in 1881 who intentionally tossed a bomb at the Czar, killing himself in the process, may indeed be the first intentional suicide bombing. Another interesting example is that of captured anarchist, Louis Lingg, who was scheduled to hang for his role for inciting the Haymarket Riot. On November 10, 1887, while in jail, he committed suicide by exploding a small device in his mouth that had been smuggled in by an associate. Amazingly four “gaspipe” bombs had been found in his cell four days earlier as part of a jail break plot. Concerning this plot, see “Bombs in Lingg’s Cell”, *The New York Times* (November 7, 1887, Wednesday): 1. See: http://query.nytimes.com/mem/archive-free/pdf?_r=1&res=9C07E7D91E38E033A25754C0A9679D94669FD7CF (accessed 18 January 2010). It should be noted these incidents of Anarchist terror eventually subsided and have had no influence on today’s religious wave of terrorist and insurgent suicide bombings.

6. See Richard O’Neill, *Suicide Squads*. Sydney, Lansdowne Press, 1981.
7. See Keith William Nolan, *Sappers in the Wire*. College Station, TX: Texas A&M University Press, 1995.
8. For instance the Hollywood movie *Platoon* (1986) contains a scene in which a North Vietnamese Army (NVA) sapper commits suicide by detonating a satchel charge inside the command post of a firebase.
9. See May Rivers Films, *The Cult of the Suicide Bomber*. New York, NY: The Disinformation Company, Ltd., 2006: DVD, 96 mins. Narrated by Robert Baer.
10. Nerina Rustomji, *The Garden and the Fire: Heaven and Hell in Islamic Culture*. New York: Columbia University Press, 2009: 160.
11. These included Hizbollah front and allied groups such as Amal. Surprisingly, one of these groups may have engaged in a December 1981 vehicular suicide bombing in Lebanon against the Iraqi embassy that would have predated the celebrated martyrdom of Hossein Fahmideh. See the *RAND Terrorism Chronology* (1968-1997).
12. Another debate that exists focuses on how a terrorist attack on a civilian (a non-combatant) is any different—other than in lack of scale— than the strategic bombing campaigns employed by the US and Britain during World War II. These sometimes-indiscriminate air campaigns, such as the mass bombings of Dresden and Tokyo, killed tens of thousands of civilians in urban firestorms.
13. Robert J. Bunker and John P. Sullivan: 4.
14. Key works include Mia Bloom, *Dying to Kill: The Allure of Suicide Terror*. New York, NY: Columbia University Press, 2005. Robert A. Pape, *Dying to Win: The Strategic Logic of Suicide Terrorism*. New York, NY: Random House, 2005; and Mohammed M Hafez, *Manufacturing Human Bombs: The Making of Palestinian Suicide Bombers*. Washington, DC: United States Institute of Peace, 2006.
15. The reason that the Israeli experience and their countermeasures dominate our early perceptions of this evolutionary process is partially due to the fact that during the 1990s and 2000s Israeli suicide bombing “lessons learned” were exported to the counter-terrorism communities in the United States and Europe. While the Sri Lankan experience with the suicide bombing TTPs of the Tamil Tigers would be invaluable, their lessons learned were not effectively passed on to those counter-terrorism communities.
16. Concerning secular based suicide bombings: Saddam Hussein’s forces were targeting US and coalition military forces so the use may be considered legitimate although in at least one instance the Iraqi’s removed their uniforms and appeared as civilians seeking aid which is a violation of the rules of warfare. The Palestinian Liberation Organization’s (PLO), a secular group, establishment of the Al Aqsa Brigades and their subsequent use of suicide bombing may be a gray area of secular and/or religious motivations.
17. The killing of a key bomb maker, the acquiring of a stockpile of explosives or their loss, or the learning of a new method of bomb construction or detonation can all readily influence the suicide bomb TTPs utilized by a terrorist group.

18. Based on years of attending numerous terrorism and suicide bomb related briefings and conducting a multi-year study of suicide bombings for the National Law Enforcement and Corrections Technology Center-West (NLECTC-West) in the early 2000s, the author is not aware of a definitive work on the evolution of suicide bombs.

19. For information on the Dubrovka theater siege see Paul Murphy, *The Wolves of Islam*. Washington, DC: Brassey's Inc., 2004: 179-196. The standard work on the Beslan takeover is John Giduck, *Terror at Beslan*. Golden CO: Archangel Group, Inc., 2005.

20. Peter Chalk, "Tigers evolve: The Liberation Tiger's of Tamil Eelam's developing suicide attack methods," *Jane's Intelligence Review*. Vol 19. No. 3. March 2007: 17.

21. Yaakov Katz, "IDF: Cell using undetectable bomb belts," *Jerusalem Post*, 17 November 2006. OSINT provided 4 December 2006. Original link is dead. Mirrored on other websites.

22. Rola, "Liquid Explosives Hunted Across the Atlantic Busted in Lebanon," 27 February 2007. OSINT provided 5 March 2007. See <http://portal.sawtbeirut.com/content/view/4445/9/> (accessed 2 February 2010).

23. Israel Ministry of Foreign Affairs, "Suicide bombing at the Sbarro pizzeria in Jerusalem - 9-Aug-2001," nd. See http://www.mfa.gov.il/MFA/MFAArchive/2000_2009/2000/10/Suicide+bombing+at+the+Sbarro+pizzeria+in+Jerusalem.htm (accessed 26 January 2010); Israel Ministry of Foreign Affairs, "Participation of Children and Teenagers in Terrorist Activity during the Al-Aqsa Intifada," 30 January 2003. See the Bilal Wagia Kamel Walid-Ali incident for the birdcage bomb. Bombs have also been found in children's toys. See http://www.mfa.gov.il/MFA/MFAArchive/2000_2009/2003/1/Participation%20of%20Children%20and%20Teenagers%20in%20Terrori (accessed 26 January 2010); "Computer bomb intercepted en route to Tel Aviv," *Jerusalem Post*. 26 January 2004. Link is dead. Reposted on Northeast Intelligence Network, See http://homelandsecurityus.com/?page_id=13.; An explosive device hidden in a watermelon was also used in an attempted bus bombing attack in September 2001 but it was not planned as a suicide attack because the Popular Front for the Liberation of Palestine (PFLP) is secular so they operative would not be expected to martyr himself. See Israel Ministry of Foreign Affairs, "Israel Police and ISA Arrest Jerusalem PFLP Cell - 4-Sep-2001," nd. See <http://www.mfa.gov.il/MFA/Government/Communiques/2001/Israel+Police+and+ISA+Arrest+Jerusalem+PFLP+Cell+-+htm> (accessed 26 January 2010).

24. Israel Ministry of Foreign Affairs, "Suicide bombing at the Sbarro pizzeria in Jerusalem - 9-Aug-2001."

25. "Ahmed Shah Massoud," *The Independent*, Obituaries. Monday, 17 September 2001. See <http://www.independent.co.uk/news/obituaries/ahmed-shah-massoud-729417.html> (accessed 3 February 2010); Associated Foreign Press (AFP), "Cops eye fugitive terrorist in Indonesia blasts: Bomb hidden in laptop computer is also found at hotel hit by suicide attack," Saturday 18 July 2009. See <http://www.msnbc.msn.com/id/31979442/> (accessed 26 January 2010).

26. Randeep Ramesh, "Minister targeted in Sri Lanka suicide attack," *The Guardian*. Wednesday 28 November 2007. See <http://www.guardian.co.uk/world/2007/nov/28/srilanka> (accessed 26 January 2010) and Associated Foreign Press (AFP), "Tamil bra bomber targets Sri Lanka minister: military," 27 November 2007. See <http://afp.google.com/article/ALeqM5hypJWWD9ww4hQudZ5VyS1FeKWmhA> (accessed 27 January 2010).
27. Peter Chalk, "Tigers evolve: The Liberation Tiger's of Tamil Eelam's developing suicide attack methods," *Jane's Intelligence Review*. Vol 19. No. 3. March 2007: 17.
28. Gary Jones, "Airport Cops on Bra Bomb Alert," *The Daily Mirror*. Wednesday 4 May 2005. Link dead. Reposted on <http://archives.californiaaviation.org/airport/msg34896.html>; Imran Asghar, "Terrorists develop 'suicide underwear,'" *Daily Times*. Thursday, July 31, 2008. See http://www.dailytimes.com.pk/default.asp?page=2008%5C07%5C31%5Cstory_31-7-2008_pg1_4 (accessed 27 January 2010).
29. One citation states "Investigators believe the Russian bombers wore plastic explosives on their body, which enabled them to walk through metal detectors without setting off alarms." This in actuality means a low metal content bomb was used, no fragmentation and minimal metal in the detonation system. Bra bombs are a well-known security concern though not publicly mentioned. See Jeff Price, "Coming Soon: Airport Security 2005." January 2005. See <http://www.airportjournals.com/Display.cfm?varID=0501007> (accessed 20 September 2006).
30. The type of explosive devices, other than that they were hexogen based, which caused the blasts are still unknown. See Associated Press, "Russia plane crashes caused by explosives: 'Black box' recording shows no evidence of hijacking," Monday, Aug 30, 2004. See <http://www.msnbc.msn.com/id/5810127/> (accessed 27 January 2010).
31. Maddy Sauer, "Authorities Warning Women Not to Wear Gel Bras As Worries of Possible Female Bombers Increase," 16 August 2006. See http://blogs.abcnews.com/theblotter/2006/08/authorities_war.html (accessed 27 January 2010).
32. Tim Butcher, "Suicide bomber caught with explosives in her underwear," Wednesday June 22 2005. See <http://www.independent.ie/world-news/suicide-bomber-caught-with-explosives-in-her-underwear-255579.html> (accessed 27 January 2010).
33. Imran Asghar, "Terrorists develop 'suicide underwear,'" *Daily Times*.
34. Gary Jones, "Airport Cops on Bra Bomb Alert," *The Daily Mirror*. Wednesday 4 May 2005. Link dead. Reposted on <http://archives.californiaaviation.org/airport/msg34896.html>.
35. Seat location cited in United States District Court, District of Massachusetts "US v. Richard Colvin Reid," Government's Sentencing Memorandum, Filed January 17, 2003.
36. Richard Esposito and Brian Ross, "Investigators: Northwest Bomb Plot Planned by al Qaeda in Yemen," (26 December 2009). See <http://abcnews.go.com/print?id=9426085> (accessed 20 January 2010).
37. Compiled from news reports and analysis including Michael Elliott, "The Shoe Bomber's World," *Time*. Saturday, 16 February 2002. See

<http://www.time.com/time/world/article/0,8599,203478,00.html> (accessed 3 February 2010); United States District Court, District of Massachusetts, “United States of America v. Richard Colvin Reid,” Indictment. nd: 11; and The NEFA Foundation, *KSM’s Transatlantic Shoe Bomb Plot*. No. 11. September 2007.

38. Type of aircraft cited in United States District Court, District of Massachusetts, “United States of America v. Richard Colvin Reid,” Indictment. nd: 11.

39. The NEFA Foundation, *KSM’s Transatlantic Shoe Bomb Plot*. No. 11. September 2007: 3-4.

40. This device was said to contain ball bearings for fragmentation effect. This would have made it more susceptible to metal detector screening. “‘Shoe bomber’ hits Baghdad mosque”. *BBC News*. Friday, 16 June 2006. See <http://news.bbc.co.uk/2/hi/5086326.stm> (accessed 22 January 2010).

41. See “New U.S. Alert for Shoe Bombers.” *ABC News*. 25 October. See <http://blogs.abcnews.com/theblotter/2007/10/new-us-alert-fo.html> (accessed 20 January 2010) and DHS-FBI, (*U//FOUO*) *Terrorist Use of Modified Footwear to Conceal Explosive Devices*. 24 October 2007. Available online at netafoundation.org (accessed 20 January 2010).

42. “United States v. Ramzi Ahmed Yousef, et al.” United States Court of Appeals for the Second Circuit, August Term, 2001: 9-10.

43. Henry Morgenstern, “Liquid Explosives: Can We Detect, Prevent and Respond to this Threat?,” *Journal of Counterterrorism & Homeland Security International*. Vol. 13. No. 2. Summer 2007: 31.

44. “United States v. Ramzi Ahmed Yousef, et al.”: 13.

45. Charlotte Gil and Sam Greenhill, “British Muslims ‘planned to kill thousands by bringing down SEVEN transatlantic airliners in one go with liquid bombs,’” 4 April 2008. See <http://www.dailymail.co.uk/news/article-555465/British-Muslims-planned-kill-thousands-bringing-SEVEN-transatlantic-airliners-liquid-bombs.html> (accessed 25 January 2010). Allegations of taking an infant on board one of the targeted aircraft, so its bottle could be used to transport some of the liquid explosives, and that a homemade martyrdom video was produced were also made. Numerous prosecutions resulted from this plot. See The NEFA Foundation, *Bojinka II: The Transatlantic Liquid Bomb Plot*. No. 15. April 2008.

46. See Transportation Security Administration (TSA), “Agency Adjusts Liquid Ban, Aviation Threat Level Remains High,” 25 September 2006. See http://www.tsa.gov/press/happenings/9-25_updated_passenger_guidance.shtm (accessed 25 January 2010) and “Make Your Trip Better Using 3-1-1,” nd. See <http://www.tsa.gov/311/> (accessed 25 January 2010).

47. Hugo Martin, “A tech-firm gold rush: boosting airport security,” *Los Angeles Times*. Tuesday, 26 January 2010: B6.

48. This was apparently a second attempt at this sort of bombing. On 13 November 2009 a Somali national was arrested with a similar liquid syringe and solid explosives prior to boarding a flight from Mogadishu to Hargeisa to Djibouti and then to Dubai. Sean O’Neill et al.

“Passengers to be scanned after details emerge about Somali bomb plot.” *TimesOnline*. 31 December 2009. See <http://www.timesonline.co.uk/tol/news/world/article6972127.ece> (accessed 16 March 2010).

49. Compiled from news reports including Richard Esposito and Brian Ross, “Investigators: Northwest Bomb Plot Planned by al Qaeda in Yemen,” (26 December 2009). See <http://abcnews.go.com/print?id=9426085> (accessed 20 January 2010) and “Exclusive: Photos of Northwest Airlines Flight 253 Bomb,” (28 December 2009). See <http://abcnews.go.com/Blotter/northwest-airlines-flight-253-bomb-photos-exclusive/story?id=9436297> (accessed 20 January 2010).

50. Given the recentness of the incident, debate is currently taking place concerning whether the bomb was ideally placed for maximum effect. Clive Irving, “Why the Jockstrap Bomber picked seat 19A.” *MSNBC*. Wednesday, January 13, 2010. See <http://www.msnbc.msn.com/id/34831499/ns/travel-news/> (accessed 20 January 2010). Also a recent news test of a device similar to the one used in the incident and detonated on a decommissioned Boeing 747 did not result in a hull breach or loss of a wing. However the plane was not depressurized for the proper flight altitude and, even though no fuel tanks were breached, it is unknown if they had been partially filled up with fuel to accurately recreate flight conditions. See “Plane survives ‘Flight 253-style’ blast” (with Video of the test). *BBC News*. 5 March 2010. See <http://news.bbc.co.uk/2/hi/8547329.stm> (accessed 9 March 2010).

51. Blogs.abcnews.com, “New U.S. Alert for Shoe Bombers,” (25 October 2007). See <http://blogs.abcnews.com/theblotter/2007/10/new-us-alert-fo.html> (accessed 12 November 2009).

52. Terrorists have used arm casts to hide firearms for assassination attempts. This took place with the Anarchist assassination of US President William McKinley in 1901 and in the Philippines in the 1980s with an assassination attempt made on the wife of the Philippine president. See Global-security-training.com, “Learning from the enemy side,” (n.d.). See http://www.global-security-training.com/html/learning_from_the_enemy.html, (accessed 12 November 2009). Originally published in *Journal of Counterterrorism & Security International*.

53. Cocaine has been formed into a leg cast for smuggling purposes and the same principle would be applied to forming explosives into a medical cast that could be worn. See *Sky News*, “El Prat: Smuggler’s Leg Cast Made of Cocaine,” (6 March 2009). See http://news.sky.com/skynews/Home/World-News/Leg-Cast-In-Cocaine-Found-By-Barcelona-Police-Chilean-Man-Carrying-5kg-Of-Drugs-Around-Broken-Bone/Article/200903115236236?lpos=World_News_Article_Related_Content_Region_4&lid=ARTICLE_15236236_Leg_Cast_In_Cocaine_Found_By_Barcelona_Police%2C_Chilean_Man_Carrying_5kg_Of_Drugs_Around_Broken_Bone, (OSINT provided 6 March 2009).

54. Explosives can be highly toxic so anytime an explosive is placed near human skin it is assumed some sort of non-permeable membrane will be placed between them.

55. Jeff Price, “Coming Soon: Aviation Security 2005’, *Airport Journals* (January 2005). See <http://www.airportjournals.com/Display.cfm?varID=0501007>, (accessed 20 September 2006).

56. Pierre Thomas, Jack Date, and Theresa Cook, “Common Items, Extraordinary Threat,” 10 April 2008. See <http://abcnews.go.com/TheLaw/FedCrimes/story?id=4628707&page=1> (accessed 10 April 2008).

57. A Department of Homeland Security and FBI assessment warned that female suicide bombers could use “prosthetic devices that mimic the look of a pregnant woman.” See Foxnews.com, “DHS, FBI Warn of Possibility of Female Homicide Bombers,” (Tuesday, 12 February 2008). See <http://www.foxnews.com/story/0,2933,330415,00.html>, (accessed 13 November 2009).

58. See Tim Devaney and Tom Stein, “Winerack: A New Way to Wear (and Drink) Beer” Allbusiness.com (Wednesday, 21 November 2007). See <http://www.allbusiness.com/business-planning-structures/starting-a-business/4969109-1.html>, (accessed 20 November 2009). The company selling The Winerack and The Beerbelly has a website at: <http://www.thebeerbelly.com>.

59. The PKK bomber “...killed 6 Turkish soldiers, and injured 30 people. The explosives were strapped to her stomach as if she were pregnant.” The Tamil bomber critically wounded Sarath Fonseka, the Sri Lankan army chief of staff, by gaining access to a military base. See Clara Beyler, “Chronology of Suicide Bombings Carried out by Women,” International Institute for Counter-Terrorism (12 February 2003). See <http://www.ict.org.il/Articles/tabid/66/Articlsid/645/currentpage/21/Default.aspx>, (accessed 13 November 2009) and Anat Berko, *The Path to Paradise*. Westport, CT: Praeger Security International, 2007: 113.

60. That hand had a built-in fragmentation grenade in it that was to be used to kill the President when Frankenstein would get to shake his hand after winning the car race.

61. BBC News, “Man ‘steals iguanas in fake leg,’” (Saturday 22 September 2007). See <http://news.bbc.co.uk/2/hi/americas/7007942.stm>, (accessed 12 November 2009) and John Kay, “CS gas in false leg at jail,” *The Sun* (1 December 2008). See <http://www.thesun.co.uk/sol/homepage/news/1989542/CS-gas-in-false-leg-at-jail.html>, (accessed 12 November 2009).

62. Abcnews.com, “Crime Blotter: Hiding Drugs in a Potbelly,” (20 April, 2004). See <http://abcnews.go.com/US/CrimeBlotter/story?id=90066&page=1&page=1>, (accessed 12 November 2009) and Houston (Associated Press), “Obese Texas inmate hides gun in his flabs of fat,” Usatoday.com (8 August 2009). See http://www.usatoday.com/news/nation/2009-08-08-obese-inmate-gun_N.htm, (accessed 12 November 2009).

63. *Asian Political News*, “Policewomen killed, bomb explodes in funeral pyre in Kathmandu,” (22 August 2005). See http://findarticles.com/p/articles/mi_m0WDQ/is_2005_August_22/ai_n14940853/, (OSINT 4 April 2007). From Kyodo News International, Inc., and *The Canadian Press*, “Insurgents planting IEDs inside human corpses in Kandahar, says ISAF”, (24 December 2007). See milnewstbay.pbworks.com/f/IED-Bodies-CP-250358Dec07.pdf, (accessed 13 November 2009). For placing bombs in animal corpses see Reuters, “Iraq group uses ‘dog bomb’ against U.S. forces,” (13 August 2006). See <http://www.alertnet.org/thenews/newsdesk/L13114314.htm>, (Link is dead, mirrored on other sites (OSINT provided 13 August 2006).

64. For instance, the US Transportation Security Administration currently deploys covert officer teams at 161 US airports. The officers engage in passenger behavior analysis so that those passengers identified as acting suspiciously can be subjected to additional screening. See Ken Kaye, “TSA follows every move,” (Sunday, 15 November 2009). *Los Angeles Times*: A15.

65. This section of the work greatly benefited from the comments and insights provided by reviewers with Islamic cultural, religious, and language expertise. Because some are members of the US counter-terrorism community, their identities will remain anonymous.

66. Sayyid Muhammad Rizvi, Chapter 3: The Islamic Sexual Morality (2) Its Structure (Continued)” in *Marriage and Morals in Islam*. Scarborough, Ontario, Canada: Islamic Education & Information Centre, 2001 See http://www.al-islam.org/m_morals/chap3b.htm (accessed 16 November 2009).

67. IslamOnline.net, “Islam’s Stance on Breast Implants,” (10 August 2002). See http://www.islamonline.net/servlet/Satellite?pagename=IslamOnline-English-Ask_Scholar/FatwaE/FatwaE&cid=1119503545652 (accessed 18 November 2009).

68. Tzvi Ben Gedalyahu, “Arab Files for Patent for ‘Killer’ Microchip,” (18 May 2009). *Arutz Sheva*. See <http://www.israelnationalnews.com/News/News.aspx/131411> (accessed 18 November 2009).

69. The *Quran* and the *Hadiths* were written centuries prior to the development of explosives. Those works are so old, in fact, that they pre-date the terrorist body cavity bomb use projections articulated in this work by over one thousand years.

70. See “Bombs in Lingg’s Cell”, *The New York Times* and “Man Claiming to be Armed with Mouth Bomb Fails in Robbery Attempt”. 6 October 2005. See <http://www.azcentral.com/offbeat/articles/1004bomb.html> (dead link). Mirrored at http://www.loweringthebar.net/2005/10/man_claiming_to.html (accessed 16 February 2010).

71. Date of the arrest of the Trinidadian mule not mentioned— determined by article publication and sentencing dates. “Child ‘drugs mule’ recovering in hospital”, BBC News. Friday, 12 April 2002. See <http://news.bbc.co.uk/2/hi/americas/1925464.stm> (accessed 17 February 2010) and Christine Jeavans, “Sunshine island’s deadly trade”, BBC News. Monday, 3 October 2005. See http://news.bbc.co.uk/2/hi/uk_news/4252138.stm (accessed 17 February 2010).

72. Sick mules are not uncommon on commercial airliners. In a recent September 2009 incident on a Spanish airliner, a mule fainted due to severe stomach pain due to ‘foreign substances in the intestines’. See Associated Foreign Press, “Sick drug mule forces emergency landing,” 16 September 2009. See <http://www.watoday.com.au/travel/travel-news/sick-drug-mule-forces-emergency-landing-20090916-fqhr.html> (accessed 17 February 2010).

73. Natural-orifice surgery is quickly maturing and makes for interesting bomb placement and assembly potentials. See Tina Peng, “Open Wide. No, Wider”, *Newsweek*. 14 April 2008: 40.

74. Christopher Nolan, Director. *The Dark Knight*. Warner Brothers, 18 July 2008 release.

75. See the Associated Press, “Cell Phones Found Inside Four Prisoners”, *The Washington Post*. Thursday 7 September 2006. See <http://www.washingtonpost.com/wp-dyn/content/article/2006/09/07/AR2006090701302.html> (accessed 17 February 2010); Reuters, “Prisoner caught with grenade where?” Friday 2 March 2007. Originally obtained via email on 6

March 2007 from Bruce Gadbois. See <http://www.reuters.com/article/idUSN0135829820070302> (accessed 17 February 2010).

76. Numerous leads, suggestions, and photos have been provided to the author while conducting briefings on this emerging threat area. It is still unclear why the individual in the x-ray had a Silly String can lodged in their rectum—what matters however is the sizeable volume of explosives such a can represents. A large banana shaped drug packet (Fig. 4) and multiple large sausage shaped drug packets (Fig. 5) in the recto-sigmoid area of mules in a paper on radiology and contraband smuggling also confirm that large explosive payloads can be achieved. See Surana Santosh Kumar et al., “Diagnostic Radiographic Findings in Body Packers: A study of 15 Cases in Kuwait”, *The Internet Journal of Radiology*. 2007 Vol. 6 No. 2. See <http://www.ispub.com/ostia/index.php?xmlFilePath=journals/ijra/vol6n2/smugglers.xml> (accessed 18 February 2010).

77. John Minnery, *CIA Catalog of Clandestine Weapons, Tools, and Gadgets*. Boulder, CO: Paladin Press, 1990: 32-36.

78. *Ibid*: 32.

79. F. Benjamin et al. “Vaginal smuggling of illicit drug: a case requiring obstetric forceps for removal of the drug container.” *American Journal Obstetrics & Gynecology*. 1994 Nov; 171 (5): 1385-1387.

80. “Pistol Packing Momma Stashes Pistol in Vagina.” 4 December 2006. See <http://crimesift.com/> (accessed 18 February 2010) and Reuters, “Prisoner caught with grenade where?”

81. Associated Press, “Prison Visitor Allegedly Uses Vagina To Smuggle Live Grenade.” Thursday, 20 April 2006. Posted on numerous sites (accessed 18 February 2010).

82. The consensus is generally “...that the termination of a pregnancy after four months - the point at which, in Islam, a fetus is thought to become a living soul - is not permissible. Many Islamic thinkers contend that in cases prior to four months of gestation, abortion should be permissible only in instances in which a mother's life is in danger or in cases of rape.” The Pew Forum on Religion and Public Life, “Religious Groups’ Official Positions on Abortion.” 30 September 2008. See <http://pewforum.org/docs/?DocID=351> (accessed 18 February 2010). For a more in depth analysis see Ibrahim B. Syed, “Abortion in Islam.” nd. See <http://www.islamawareness.net/FamilyPlanning/Abortion/abortion3.html> (accessed 16 November 2009).

83. “Three Men Found Guilty Of Liquid Bomb Plot.” *SkyNews*. Tuesday 8 September 2009. See <http://news.sky.com/skynews/Home/UK-News/Liquid-Bomb-Plot-Trio-Planned-To-Kill-Thousands-Of-People-By-Blowing-Up-Transatlantic-Planes/Article/200909115376537> (accessed 18 February 2010).

84. Reuters, “Pregnant Palestinian planned suicide bomb: Israel.” Wednesday 13 June 2007. See <http://www.reuters.com/article/idUSL1387765320070613> (accessed 18 February 2010).

85. See “Bad-ass Brass Knuckle Implants” *BME News*. 7 Dec 2005.

<http://news.bmezzine.com/2005/12/07/bad-ass-brass-knuckle-implants/> (accessed 19 February 2010). This site contains extreme implants, scarification, and piercing. For actual implant photos see "Implants." 2004. <http://www.ishiboo.com/~danny/Mods/implants/> (accessed 19 September 2009).

86. The image of a letter bomb sent to the Myanmar Embassy in Tokyo on 28 October 2002 portrays the thinness that can be achieved with sheet explosives. A belly bomb placed under the subcutaneous fat layer could be much thicker giving it more explosive force. "The New Light of Myanmar." See http://www.myanmar.gov.mm/NLM-2002/enlm/Nov1_head4.html (accessed 19 February 2010).

87. Associated Press, "Puppies used as drug mules". *The Sydney Morning Herald*. 2 February 2006. See <http://www.smh.com.au/news/world/puppies-used-as-drug-mules/2006/02/02/1138836342482.html> (accessed 19 February 2010).

88. "The constant change in concealment methods." *U.S. Customs Today*. July 2000. See <http://www.customs.gov/custoday/jul2000/conceal.htm>. (accessed 21 February 2010).

89. *Ibid.* See also "CBP Inspectors Find Heroin in Teddy Bear." Friday, 12 September 2003. See http://www.cbp.gov/xp/cgov/newsroom/news_releases/archives/cbp_press_releases/092003/09122003.xml. (accessed 21 February 2010).

90. Numerous variables exist when comparing and contrasting underwater naval mines and landmines to body cavity bombs. The basic argument is simply that if you can explode a bomb underwater or underground then you can also explode one inside the human body.

91. "Oxidizing Materials." Last revised 2 August 1997 by Dr. Nancy Magnussen, College of Science, Texas A&M University. See <http://safety.science.tamu.edu/oxidizers.html> (accessed 2 March 2010).

92. "STONE: It was the largest pipe bomb in U.S. history, weighed in excess of 40 pounds. It used a steel plate as a directional device, it was contained in a military pack." CNN PRESENTS, The Hunt for Eric Rudolph. Aired June 15, 2002 - 20:00 ET. See <http://transcripts.cnn.com/TRANSCRIPTS/0206/15/cp.00.html> (accessed 3 March 2010).

93. For information on EFPs and shaped charge theory see "Shaped Charge." Page last modified 29 May 2008. See <http://www.globalsecurity.org/military/systems/munitions/bullets2-shaped-charge.htm> (accessed 3 March 2010).

94. GPS was used in a Pakistani vehicular suicide bombing in March 2008 to guide the bomber to the target and then to explode the device via a text message signal. "GPS Used by Suicide Bomber in Pakistan," *Executive-Protection-News.Com*. 7 May 2008 hard copy print out. See executive-protection-news.com/?p=335 (link is dead). Mirrored at <http://wecite.wordpress.com/2008/05/20/taliban-the-show-must-go-on/>.

95. Red teaming is being conducted in this regard at the US Transportation Security Laboratory with over 200 bombs, hidden in all kinds of objects such as dolls and food items, exploded in decommissioned airliners. See Bob Drogin, "Cooking up ways to stop terrorists." *Los Angeles Times*. Monday, 12 October 2009: A1, A12.

96. Transportation Security Administration (TSA), (U) *Incidents at U.S. Airports May Suggest Possible Pre-Attack Probing*. TSA 10TG7-058. U//FOUO (For Official Use Only). 20 July 2007: 1-3. PDF available at: msnbcmedia.msn.com/i/msnbc/sections/.../airport%20warning.pdf (accessed 12 November 2009).

97. *Ibid*: 1-2:

98. *Ibid*: 1.

99. Steve Schmidt and Karen Kucher, “Report of terrorist ‘dry run’ at Lindbergh a false alarm.” *San Diego Union Tribune*. 25 July 2007. See <http://legacy.signonsandiego.com/news/metro/20070725-1207-bn25false.html> (accessed 26 July 2007). Still as early as 29 November 2006 a (U) Joint FBI-DHS Intelligence Bulletin entitled *Terrorist Use of ‘Dry Run’ Tactic May Be Tip-Off for Imminent Terrorist Attack* was reported on by the media. This bulletin contained (U//FOUO) information.

100. For example see Steve Tompson, “Women arrested after police standoff.” *The Dallas Morning News*. Tuesday, 17 July 2007. See http://www.dallasnews.com/sharedcontent/dws/news/localnews/stories/DN-standoff_17met.ART.State.Edition1.76e4a1.html (accessed 17 July 2007 via ai OSINT/Jihadwatch); and Annie Jacobsen, “Incident on Frontier Airlines Flight 623.” *The Aviation Nation*. 10 October 2007. See <http://www.theaviationnation.com/2007/10/10/incident-on-frontier-airlines-flight-623/> (originally provided on 10 October by ai OSINT). Also Annie Jacobsen, “Frontier Airlines Confirms Incident on Flight 623.” *The Aviation Nation*. 15 October 2007. See <http://www.theaviationnation.com/2007/10/15/frontier-airlines-confirms-incident-on-flight-623/> (accessed 5 March 2010).

101. Andrew Blankstein, “LAX passenger hides objects in his body; bomb squad called.” *Los Angeles Times*. Wednesday, 7 March 2007: B3.

102. *Ibid*; Annie Jacobsen, “TSA Finds Mock IEDs, Issues Aviation “Dry Run” Alert.” *The Aviation Nation*. Tuesday, 24 July 2007. See <http://www.theaviationnation.com/2007/07/24/tsa-finds-mock-ieds-issues-aviation-dry-run-alert/> (accessed 5 March 2010).

103. Andrew Blankstein: 3.

104. *Ibid*; Reuters, “Wired Iraqi man triggers scare at L.A. airport.” Tuesday 6 March 2007. See <http://www.reuters.com/article/idUSN0643957420070306> (accessed 3 March 2010).

105. Andrew Blankstein: 3.

106. *Ibid*.

107. An advanced public records and criminal background search—utilizing public records databases—was conducted on Fadhel al-Maliki (Fadhel Almaliki) on 5 March 2010 with one hit to an individual in Falls Church, VA. This individual had no prior addresses in Atlantic City, NJ and no prior criminal convictions listed however, interestingly enough, this area is known for its radical Mosque.

108. Conceptually based on narcotics trafficking methods using body cavities. Sheila MacVicar, "Al Qaeda Bombers Learn from Drug Smugglers." *CBS Evening News*. 28 September 2009. See <http://www.cbsnews.com/stories/2009/09/28/eveningnews/main5347847.shtml> (accessed 29 September 2009).

109. These were the airports traveled through according to Al Qaeda. Leonard Doyle, "New al-Qaeda 'body bombs' that can beat airport security are alarming terror experts." 3 October 2009. See <http://www.telegraph.co.uk/news/uknews/terrorism-in-the-uk/6258137/New-al-Qaeda-body-bombs-that-can-beat-airport-security-are-alarming-terror-experts.html> (accessed 13 October 2009).

110. Since al-Asiri was in the custody of Saudi state security, this is all dependent on the protocols in place and the relationship of this security force and the airport security screeners.

111. Overseas Security Advisory Council (OSAC), "Saudi Arabia Airport Screening Procedures Safety & Security; Middle East / N. Africa - Saudi Arabia." 15 July 2009. This report was produced in conjunction with the Regional Security Office at U.S. Embassy Riyadh. See <http://www.osac.gov/Reports/report.cfm?contentID=104919> (accessed 8 March 2010).

112. This is ambiguous because later, as al-Asiri was to physically approach the Prince, he was not searched as a sign of respect. See The Associated Press, "Saudi Prince wounded by suicide bomber vows to fight Al-Qaida." *HAARETZ.com*. 28 August 2008. See <http://www.haaretz.com/hasen/spages/1110831.html> (accessed 10 March 2010).

113. Reuters (Dubai), "Saudi prince spoke to bomber on phone before attack." 2 September 2010. See <http://www.reuters.com/article/idUSTRE5805NW20090901> (accessed 10 March 2010).

114. Anthony Kimery, "The Threat of Body Bombs and Surgical Implants." *HSToday*. Thursday, 1 October 2009. See <http://www.hstoday.us/content/view/10451/150/> (accessed 17 May 2010).

115. These keywords were translated in the video "Storing Bombs Inside Bodies." *CBS News*. 28 September 2009. See <http://www.cbsnews.com/video/watch/?id=5347857n> (accessed 10 March 2010). The original Al Qaeda tape in Arabic was posted on 21 September 2009 by UNSAFE 007. See <http://www.youtube.com/watch?v=CaRIAMgHm-c&feature=related> (accessed 30 October 2009).

116. See "Storing Bombs Inside Bodies." *CBS News*. Also see the video "Explosives 'inside' suicide bomber." BBC News. 25 September 2009. See <http://news.bbc.co.uk/2/hi/8276007.stm> (accessed 30 October 2009) Interestingly, a few days later the Saudis confirm that Al Qaeda has access to such detonators— "He [bin Naif] cited recent arrests of suspects 'with advance degrees' on charges of promoting and sponsoring terrorism in the Kingdom. A number of wireless detonators were confiscated with them." Galal Fakkar, "Attack won't change policy: Naif." *Arab News*. See <http://archive.arabnews.com/?page=1§ion=0&article=125952&d=31&m=8&y=2009> (accessed 10 March 2010).

117. In addition to the above Western video footage, the still photographs of the bombing are as follows: Picture 1) Blast scene by window with debris and scattered furniture; Picture 2) Wall, ceiling, drape with blood splatter and small hole in ceiling; Picture 3) Close up of ceiling

with bomber's fingers and hand evident; Picture 4) Lower half of bomber's foot on edge of rug; Picture 5) Seat of explosion by window with bomber's head and upper torso facing down; Picture 6) Close up of bomber's head and upper torso facing down; and Picture 6) Close up of bomber bomber's head and upper torso rolled over and facing up. These images have the following stamp on them— www.alriyadh.com which belongs to the Al Yamama Press in Saudi Arabia. 2 September 2009. Issue no. 15045. Text is in Arabic and the pictures on this site are in a different order and interspersed with other photos. See http://translate.google.com/translate?hl=en&sl=ar&u=http://www.alriyadh.com/&ei=EiWYS5rjIpHWtgOnyPg_&sa=X&oi=translate&ct=result&resnum=1&ved=0CBIQ7gEwAA&prev=/search%3Fq%3Dwww.alriyadh.com%26hl%3Den%26safe%3Doff%26client%3Dfirefox-a%26hs%3DVp%26rls%3Dorg.mozilla:en-US:official (accessed 10 March 2010). These still and video images, including access to *The Grandchildren of Muhammad ibn Maslamah* video, are the ones that were provided to David A. Kuhn for analysis.

118. Peter Bergen, "Saudi investigation: Would-be assassin hid bomb in underwear." *CNN News*. 30 September 2009. See <http://www.cnn.com/2009/WORLD/meast/09/30/saudi.arabia.attack/index.html> (accessed 1 October 2009).

119. Still, some news and analytical briefs are accepting the Saudi party line without question— "It is now believed that the attacker in the case used an underwear bomb like the one used in the Christmas Day Attempt". "Airline Security: Gentle Solutions to a Vexing Problem." *STRATFOR Today*. 13 January 2010. Via OSINT group (received 13 January 2010). This is a reversal of the detailed STRATFOR analysis first provided on this incident without any comment concerning inconsistencies in the Saudi statements. See Scott Stewart, "AQAP: Paradigm Shifts and Lessons Learned." *STRATFOR Global Security and Intelligence Report*. 2 September 2009. See http://www.stratfor.com/weekly/20090902_aqap_paradigm_shifts_and_lessons_learned (accessed 9 March 2010).

120. In fact, this contradicts other Saudi statements— "Saudi intelligence chiefs believe al-Asiri hid the explosive device and electronic detonator in a long, thin animal gut casing to protect it from body acid after he inserted it in his intestine." David Gardner, "Air passengers face full body X-rays after suicide bombers hide devices INSIDE their bodies." *Daily Mail*. 8 October 2009. See <http://www.dailymail.co.uk/news/worldnews/article-1218562/Bombers-hide-devices-inside-bodies-Travellers-Europe-face-body-X-rays.html> (accessed 10 March 2010).

121. Part of this Al Qaeda animation reenactment of the suicide bombing can be seen at "Storing Bombs Inside Bodies." *CBS News*.

122. The purported explosive device can be seen in the Al Qaeda martyrdom video and in the Western newscasts which rebroadcast parts of it. For grenade characteristics, see Maj. James F. Gebhardt, U.S. Army (Ret), ills and trans., "Chapter 4: F-1 Hand Grenade," in *The Official Soviet Army Grenade Manual*. Boulder, CO: The Paladin Press, 1998: 31-34.

123. Further, Al Qaeda would have carried out a successful underwear bomb detonation using a cell phone system only to change their pattern of use and go on to try an untested chemical detonation system for the Christmas day airliner bombing.

124. Still, some sporadic news reports have recently been made about concerns over Al Qaeda potentially utilizing body cavity suicide bombs against high value targets in Western

Europe and America. See Steve Gardner, "Fears over 'internal' terror bomb." *BBC News*. 26 September 2009. See <http://news.bbc.co.uk/2/hi/8276016.stm> (accessed 29 September 2009); Anthony Kimery, "The Threat of Body Bombs and Surgical Implants." *Homeland Security Today*. Thursday, 1 October 2009. See www.hstoday.us/index2.php?option=com_content&do_pdf=1&id... (accessed 1 December 2009); "France Warns of New Terror Threat From 'Body Bombs.'" *Spiegel Online*. 6 October 2009. See <http://www.spiegel.de/international/world/0,1518,653487,00.html> (accessed 7 October 2009); Sharon Weinberger, "Body Bombs Create New Threats and Responses." *AOL News*. 29 December 2009. See <http://www.aolnews.com/nation/article/body-bombs-create-new-threats-and-responses/19295796> (accessed 31 December 2009); Christopher Leake, "Terrorists 'plan attack on Britain with bombs INSIDE their bodies' to foil new airport scanners." *Daily Mail*. 30 January 2010. See <http://www.dailymail.co.uk/news/article-1247338/Terrorists-plan-attack-Britain-bombs-INSIDE-bodies-foil-new-airport-scanners.html> (accessed 1 February 2010); "Bosom bombers: Women have explosive breast implants." *World NetDaily*. 1 February 2010. See <http://www.wnd.com/?pageId=123758> (via OSINT 4 February 2010); and "Report: Terrorists planning breast implant bombs." *WHDH-TV*. 11 February 2010. See <http://www1.whdh.com/news/articles/local/BO135406/> (accessed 16 February 2010). One of the earliest reports that touches upon this topic is Anthony L. Kimery, "Making Black Magic." *Homeland Security Today*. Thursday, 31 July 2008. See <http://www.hstoday.us/content/view/4517/201/1/0/> (accessed 10 March 2010).

125. These machines are in addition to hundreds of liquid explosive scanners also being purchased. See Thomas Frank, "TSA to expand use of body scanners." *USA Today*. 1 October 2009. See http://www.usatoday.com/tech/news/surveillance/2009-09-30-backscatter-body-scanners_N.htm (accessed 1 October 2009) and Thomas Frank, "Airport-Security Plan Calls for 500 Body Scanners in '11." *USA Today*. 2 February 2010. See http://www.usatoday.com/travel/flights/2010-02-02-body-scanner_N.htm (accessed 2 February 2010).

126. "Dutch to use full body scans for U.S. flights." *Reuters*. Wednesday 30 December 2009. See <http://www.reuters.com/article/idUSTRE5BT1LF20091230> (accessed 17 March 2010) and Henry Chu, "Heathrow to get full-body scanners." *Los Angeles Times*. Wednesday, 6 January 2010: A15.

127. Explosives packets (conceivably in the 50-100 gram range) hidden directly behind the testicles will only be discovered part of the time by these devices because this region represents a scanning void. Three-dimensional scans and repositioning of the body with the legs spread out and/or the body bent over with the toes being touched would greatly increase detection rates in this void area.

128. David G. Savage, "Scanners pit privacy against security." *Los Angeles Times*. Wednesday 13 January 2010: A11; Jason Chaffetz, "An Image Problem." *Newsweek*. 18 January 2010: 12; Paul Joseph Watson, "Exposed: Naked Body Scanner Images Of Film Star Printed, Circulated By Airport Staff." *PrisonPlanet*. Tuesday 9 February 2010. See <http://www.prisonplanet.com/exposed-naked-body-scanner-images-of-film-star-printed-circulated.html> (accessed 9 February 2010).

129. "Michigan: Fatwa issued against body scanners." *Los Angeles Times*. Friday 12 February 2010: A15.

130. Daily Mail Reporter, "Muslim women who refused to take 'naked' full-body scan are barred from Manchester to Pakistan flight." *Daily Mail*. 3 March 2010. See <http://www.dailymail.co.uk/news/article-1255104/Muslim-women-barred-flight-refusing-naked-body-scan.html> (accessed 3 March 2010).

131. "Sniffer dogs can't approach Muslims in England." *Daily Express* (London). Friday 27 June 2008. Link is dead. Partially mirrored on <http://israelmatzav.blogspot.com/2008/06/sniffer-dogs-cant-approach-muslims-in.html> (via OSINT 27 June 2008). This was followed by later concerns about the requirement that bomb detection dogs had to wear booties when entering Muslim homes being searched. See Stuart MacDonald, "Sniffer dogs to wear 'Muslim' booties." *The Sunday Times*. 6 July 2008. See <http://www.timesonline.co.uk/tol/news/uk/article4276489.ece> (via OSINT 6 July 2008).

132. The TSA also regularly gets criticized for lack of operational security in the handling of its documents, vulnerabilities in its screening process, and criminal behavior on the part of some of its employees. It is a large bureaucratic governmental organization with 50,000 employees and such lapses are not uncommon. For some of these criticisms see Brian Ross and Matt Hosford, "Massive TSA Security Breach As Agency Gives Away Its Secrets: Online Posting Reveals a 'How To' for Terrorists to Get Through Airport Security." ABC News. 8 December 2009. See <http://abcnews.go.com/Blotter/massive-tsa-security-breach-agency-secrets/story?id=9280503> (via OSINT 8 December 2009); *Aviation Security: Vulnerabilities Exposed Through Cover Testing of TSA's Passenger Screening Process*. GAO-08-48T. Testimony. Washington, DC: US Government Accountability Office. 15 November 2007.

133. "Spray test identifies handlers of explosives." *Geostrategy-Direct*. Week of 14 November 2007. (via OSINT 10 November 2007) and Jeanne Meserve and Mike M. Ahlers, "TSA to swab passengers' hands in search of explosives." *CNN*. 17 February 2010. <http://www.cnn.com/2010/TRAVEL/02/17/tsa.hands.swabbing/index.html> (accessed 17 February 2010).

134. Bill Siuru, "Detecting Suicide Bombers by How They Walk," *ComputerEdge*. Vol. 25. No. 20. 18 May 2007: 14, 16. and David Hambling, "Crack New Scanner Looks for Bombs Inside Body Cavities." *Danger Room*. *Wired.com*. 8 January 2010. See <http://www.wired.com/dangerroom/2010/01/crack-new-scanner-finds-explosives-inside-body-cavities/> (accessed 8 January 2010). Ground penetrating radar capabilities based upon actual field use coordinated by NLECTC-West in support of law enforcement investigations and discussions with the inventor over the last few years by the author.

Addendum

Robert J. Bunker

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November 2010

This short addendum to **The Projected Al Qaeda Use of Body Cavity Suicide Bombs Against High Value Targets** comes six-months after its completion in May 2010. This addendum highlights new indications and warning (I&W) and research pertaining to body cavity bomb use by terrorists and issues related to the new airport security screening ‘enhanced pat-down policy’ enacted by the Transportation Security Administration (TSA) since the completion of the initial paper.

It should be remembered that it is ultimately the lessons learned for the US counter-terrorism community and its practitioners where our interest lies. Three items are particularly of note concerning body cavity bombs. First, the new I&W information shows that Al Qaeda was experimenting with body cavity bomb use in Baghdad by 2008. The story initially broke in the French publication *Le Figaro* on 1 November 2010 which was informed about it from a US military source.¹ Within a week, the story was then picked up by the British *Daily Mail*, *New York Post*, and other media outlets. According to the news source Al Qaeda, bomb makers obtained two stray dogs off city streets and surgically implanted them with body cavity bombs. The intended target of the plot was a US bound cargo airliner going from Baghdad to Los Angeles. The dogs were being sent under a program in which stray Iraqi dogs are placed in US homes via animal-rescue groups. The body cavity bombs were to detonate a few hours into the flight. What foiled the plot was that the two dogs had died in their cages prior to being loaded onto the cargo aircraft due to botched stitching. Post-mortem examinations revealed the explosive and detonator components of the devices. The information and photos pertaining to these devices were then shared with US intelligence and aviation security agencies.² Of note is that the British *Daily Mail* mentioned a French terrorism expert, Christophe Naudin, who said in the original *Le Figaro* story that “Western security services are also aware of the possibility that terrorists could use children carrying bombs inside of them to destroy aircraft.”³ In summation, the Al Qaeda operation utilized two live dogs with surgically implanted bombs, targeted a cargo airliner, and directed the attack against a flight to Los Angeles International Airport (LAX). Many of these themes and topics are discussed in the white paper, with Al Qaeda again linked to an airliner threat associated with LAX and then tied back to Iraq, which further supports the original analysis conducted. This new information greatly adds more weight to the thesis that a probe was likely conducted by Fadhel al-Maliki, an Iraqi national, against LAX in 2007 and was linked to a much larger Al Qaeda body cavity bomb program in existence than had initially been theorized.

Second, the Europol Counter-Terrorism Unit published the ten page briefing *The concealment of Improvised Explosive Devices (IEDs) in rectal cavities* on 18 September 2010.⁴ The document provides an overview of the Al Qaeda body cavity bomb

assassination attempt against the Saudi Prince Mohammed bin Nayef in August 2009. The document went to great lengths to "...assess the possible use of a new modus operandi for suicide bombings..." without being able "...to officially confirm the hypothesis about the place of the IED's concealment and the means used for its activation."⁵ Absent from the document was any type of meaningful post-blast forensic analysis. This suggests that the unit either, truthfully, did not have direct access to Saudi State Security forensic findings, via lack of a cooperation agreement as mentioned in the report, or by actually making such a confirmation, via such official analysis, the report would have become a classified document based upon prevailing European protocols. Regardless of these issues, the unit put forth the same hypothesis as this author and others that it "...could be the direct activation of the charge by the prince by the fact of dialing a certain phone number, provided by the terrorist, which could be integrated in the device."⁶ Additionally, the report resulted in three conclusions which support the analysis conducted in the paper:

- It would be possible to explode a device concealed in the rectum.
- The activation by radiofrequency seems to be the modus operandi for this terrorist attack.
- Concealing an IED in the rectum would limit the amount of explosive available, due to the reduced volume of space available and the need of an activation mechanism to be concealed in the same location.⁷

The third item of interest pertains to enhanced pat-downs conducted by TSA personnel towards airliner passengers refusing to now undertake a full body scan. Recent public uproar over the implementation of these new policies is currently getting increased media attention. The trigger point for this new policy is the additional fielding of body imaging machines and new security concerns stemming from October 2010 Al Qaeda offensive activities. These activities are related to the use of hard to detect PETN (pentaerythritol tetranitrate) time bombs, assembled in 'clean rooms' and sealed in plastic to minimize vapor signatures, hidden in computer printer cartridges sent via cargo airliners to the US. Such Al Qaeda activities are said to be part of their new 'death by a thousand cuts' initiative which seeks to leverage numerous small and cheap attacks intended to economically bleed US society—its government, people, and economy—in a terrorist war of economic attrition.⁸

Our focus concerning body imaging, however, is not to get into issues of privacy and the appropriateness (or lack of appropriateness) of groin hand-searches of a very small minority of the flying public and their dependents who refuse such digital imaging. Rather the recognition of the threat itself is of primary concern. The TSA is focused on what their chief, John Pistole, says is to "...detect the next generation of non-metallic devices' used in explosives..."⁹ What is not being said is that the generation of these devices being focused upon are solely those that are externally placed. This will either be done via the fielding of increasing numbers of fully body scanners or by the enhanced, and ultimately more intrusive, pat-downs being implemented. Unfortunately, this is

essentially ‘a mug’s game’ (i.e. futile endeavor) because the current iteration for terrorists is already to take close to the body bombs and internalize them. Not only is the futility of the effort recognized in the initial paper but, increasingly, other counter-terrorism experts are coming to the same conclusion as are some segments of an increasingly disgruntled general public.¹⁰ What can be considered an anti-government video was recently placed on Youtube entitled *Anal-Cavity Bomb Undetected by TSA and Body Scanner*. It is a compilation of news broadcasts with front and back end cartoon imagery which questions current TSA passenger screening methodology.¹¹ The dilemma we face is that the TSA is increasingly relying upon non-internal scanning technologies— millimeter wave and backscatter (x-ray)—that are unable to contend with the threat of body cavity bomb use. Further, the ‘day after’ scenario for when such a body cavity bomb incident (or incidents) does take place currently appears rather bleak and by so blatantly promoting such an external close to the body bomb detection policy in the first place the TSA is—as mentioned in the white paper— literally forcing terrorists to utilize body cavity bombs much earlier than they would have otherwise done so.

In final summation, this addendum suggests that it is increasingly imperative that the threats and issues initially highlighted in the original May 2010 white paper be fully discussed and deliberated by the US counter-terrorism community and that the TSA must definitely reconsider some of its strategic assumptions with regard to the iterated pattern of suicide bomb offensive and defensive evolutionary sequences previously identified.

Author’ Note—In a strange twist of fate, after these final comments were penned, a short article in The Atlantic entitled “Why Cavity Bombs Would Make the TSA Irrelevant” appeared in an open source intelligence list server email update. Of note is the prophetic statement:

Three experts I spoke to this weekend— two of whom are currently serving in government in counter-terrorism capacities— believe it is only a matter of time before the technique is tried here.¹²

Unfortunately so do I...

Dr. Robert J. Bunker
Los Angeles, CA
November 2010

Endnotes

1. Jean-Marc Leclerc, “Avions de ligne: la menace des chiens kamikazes”, *Le Figaro*. Novembre 2010. <http://www.lefigaro.fr/international/2010/11/01/01003-20101101ARTFIG00486-avions-de-ligne-la-menace-des-chiens-kamikazes.php> (accessed 8 November 2010). Mention of the incident information originating from a US military source was made in the English publication *Daily Mail*.
2. Summary compiled from Bill Sanderson, “Failed Al Qaeda plot involved sewing bombs inside dogs”, *New York Post*. 7 November 2010. http://www.nypost.com/p/news/international/man_worst_fiends_in_dog_plot_1h93g9Om3R6t0AGAR7XOtI (accessed 8 November 2010); and Ian Sparks, “The sick Iraqi terrorist plot to bomb a U.S. plane with exploding DOGS”, *Daily Mail*. 5 November 2010. <http://www.dailymail.co.uk/news/article-1327052/Kamikaze-canines-The-sick-Iraqi-terrorist-plot-bomb-U-S-plane-exploding-DOG.html> (accessed 8 November 2010).
3. Ian Sparks, “The sick Iraqi terrorist plot to bomb a U.S. plane with exploding DOGS”, *Daily Mail*. 5 November 2010.
4. Europol, SC5-Counter Terrorism Unit, *The concealment of Improvised Explosive Devices (IEDs) in rectal cavities*. EDOC #418506-v4. The Hague. 18 September 2010. www.strategypage.com/downloads/iedsrectalcavities.pdf (accessed 7 November 2010).
5. *Ibid*: 1.
6. *Ibid*: 7-8.
7. *Ibid*: 10.
8. See the new English Al Qaeda publication *Inspire*, November 2010 for more on what is known as *Operation Hemorrhage* directed at the US. Information on the printer bomb plot and a cover picture of the that issue of *Inspire* can be found at Daily Mail Reporter, “‘It only cost \$4,200 and was run by less than six brothers’: Al Qaeda gloats at ‘bargain’ printer bomb plot”, *Daily Mail*. 22 November 2010. <http://www.dailymail.co.uk/news/article-1331937/Al-Qaeda-s-boast-bargain-printer-bomb-plane-plot.html> (accessed 23 November 2010)
9. CNN Wire Staff, “TSA chief faces lawmakers on pat-downs, body scans”, *CNN*. 17 November 2010. http://articles.cnn.com/2010-11-17/travel/airport.security_1_pat-downs-body-scans-tsa?_s=PM:TRAVEL (accessed 17 November 2010).
10. The former head of Tel Aviv’s Ben Gurion International Airport has even gone on record to denounce the Canadian government’s use of such imaging machines and stated that he could get past such ‘virtual strip searches’ and would provide that information to officials with a security clearance. See Sarah Schmidt, “Full-body scanners are a waste of money, Israeli expert says”, *Canwest News Service*. 23 April 2010. <http://www.vancouversun.com/travel/Full+body+scanners+waste+money+Israeli+expert+says/2941610/story.html> (accessed 17 November 2010).
11. *Anal-Cavity Bomb Undetected by TSA and Body Scanner*. Youtube. 15 November 2010. Posted by RevolutionNewsDotUS. 1,233 views as of access date.

<http://www.youtube.com/watch?v=JAOsb1R-zq8&feature=related> (accessed 23 November 2010).

12. Jeffrey Goldberg, "Why Cavity Bombs Would Make the TSA Irrelevant" *The Atlantic*. 21 November 2010. Via G2-Forward OSINT server on 23 November 2010. <http://www.theatlantic.com/national/archive/2010/11/why-cavity-bombs-would-make-the-tsa-irrelevant/66849/> (accessed 23 November 2010)

Errata: Initial document update. See Medical Cast Bomb. Sentence; "Other medical variants would be bombs secreted in urine and colostomy bags." Additionally, bombs hidden inside thick sanitary napkins and Depends-like diapers, a variant on underwear bombs, must also now be considered. March 2011 note: The movie *Salt* (2010) appears to have a scene where a body cavity bomb is detonated by a foreign operative in the White House.

About the Author

Dr. Robert J. Bunker holds degrees in political science, government, behavioral science, social science, anthropology-geography, and history. Training taken includes that provided by DHS, FLETC, DIA, Cal DOJ, Cal POST, LA JRIC, NTOA, and private security entities in counter-terrorism, counter-surveillance, incident-response, force protection, and intelligence. Dr. Bunker has been involved in red teaming and counter-terrorism exercises and has in the past provided operations support within Los Angeles County. He has also engaged in sustained research and publication focusing on suicide bombing operations conducted by terrorist and insurgent forces and appropriate response strategies. Past associations have included Futurist in Residence, FBI Academy, Quantico, VA; Counter-OPFOR Program Consultant (Staff Member), National Law Enforcement and Corrections Technology Center—West, El Segundo, CA; Fellow, Institute of Law Warfare, Association of the US Army, Arlington, VA; Lecturer-Adjunct Professor, National Security Studies Program, California State University San Bernardino, San Bernardino, CA; Instructor, University of Southern California, Los Angeles, CA; and founding member, Los Angeles Terrorism Early Warning Group. Dr. Bunker has over 200 publications including short essays, articles, chapters, papers and book length documents. These include *Non-State Threats and Future Wars* (editor); *Networks, Terrorism and Global Insurgency* (editor); *Criminal-States and Criminal-Soldiers* (editor); *Narcos Over the Border* (editor); and *Red Teams and Counter-Terrorism Training* (co-author). He has provided over 200 briefings, papers, and presentations to US LE, MIL, GOV, and other groups in the US and overseas. He is currently working on a small red teaming project for the Government of Canada, Centre for Security, Armed Forces and Society pertaining to force protection and suicide bombers and on the edited book *Criminal Insurgencies in Mexico and the Americas*. He can be reached at bunker@usc.edu.

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