

Safety Moment

Use of Checklists as an Administrative Control

University of Calgary | VP Services | Environment, Health and Safety

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Introduction of Boeing B-17

In 1935 Boeing introduced the B-17 Bomber

The first B-17 flight resulted in the aircraft stalling shortly after take off

- 3 men died
- Boeing was threatened with collapse following this incident
- The incident investigation discovered that the crash was a direct result of the pilot leaving the elevator lock on – this made the airplane unresponsive to pitch control.

It was determined that this incident was not due to pilot error- the aircraft was actually too complex for pilots to fly from memory.

- As a direct result of the complexity of the B-17 Aircraft- the first pilot checklist was developed



Approved B-17 Checklist

RESTRICTED

APPROVED B-17F and G CHECKLIST	
REVISED 3-1-44	
PILOT'S DUTIES IN RED	
COPILOT'S DUTIES IN BLACK	
BEFORE STARTING	ENGINE RUN-UP
1. Pilot's Preflight—COMPLETE	1. Brakes—Locked
2. Form 1A—CHECKED	2. Trim Tabs—SET
3. Controls and Seats—CHECKED	3. Exercise Turbos and Props
4. Fuel Transfer Valves & Switch—OFF	4. Check Generators—CHECKED & OFF
5. Intercoolers—Cold	5. Run up Engines
6. Gyros—UNCAGED	
7. Fuel Shut-off Switches—OPEN	BEFORE TAKEOFF
8. Gear Switch—NEUTRAL	1. Tailwheel—Locked
9. Cowl Flaps—Open Right— OPEN LEFT—Locked	2. Gyro—Set
10. Turbos—OFF	3. Generators—ON
11. Idle cut-off—CHECKED	AFTER TAKEOFF
12. Throttles—CLOSED	1. Wheel—PILOT'S SIGNAL
13. High RPM—CHECKED	2. Power Reduction
14. Autopilot—OFF	3. Cowl Flaps
15. De-icers and Anti-icers, Wing and Prop—OFF	4. Wheel Check—OK right—OK LEFT
16. Cabin Heat—OFF	BEFORE LANDING
17. Generators—OFF	1. Radio Call, Altimeter—SET
STARTING ENGINES	2. Crew Positions—OK
1. Fire Guard and Call Clear—LEFT Right	3. Autopilot—OFF
2. Master Switch—ON	4. Booster Pumps—On
3. Battery switches and inverters—ON & CHECKED	5. Mixture Controls—AUTO-RICH
4. Parking Brakes—Hydraulic Check—On- CHECKED	6. Intercooler—Set
5. Booster Pumps—Pressure—ON & CHECKED	7. Carburetor Filters—Open
6. Carburetor Filters—Open	8. Wing De-icers—Off
7. Fuel Quantity—Gallons per tank	9. Landing Gear
8. Start Engines: both magnetos on after one revolution	a. Visual—Down Right—DOWN LEFT Tailwheel Down, Antenna in, Ball Turret Checked
9. Flight Indicator & Vacuum Pressures CHECKED	b. Light—OK
10. Radio—On	c. Switch Off—Neutral
11. Check Instruments—CHECKED	10. Hydraulic Pressure—OK Valve closed
12. Crew Report	11. RPM 2100—Set
13. Radio Call & Altimeter—SET	12. Turbos—Set
	13. Flaps $\frac{1}{2}$ — $\frac{1}{2}$ Down
	FINAL APPROACH
	14. Flaps—PILOT'S SIGNAL
	15. RPM 2200—PILOT'S SIGNAL

- 18 B-17 bombers flew 1.8 million hours without further incident after the checklist was implemented
- This proved to the government that the B-17 bomber was safe and saved the Boeing company
- 13,000 B-17 bombers flew in World War II and directly contributed to winning the war

World Health Organization (WHO)

2008 Alliance focuses on patient safety during major surgery (major surgery involves incision, excision, suturing, anaesthesia or sedation)

- Complications reported in up to 16% of procedures
- Death rate of up to 10% in developing countries
- 7 million patients harmed annually

WHO's Plan to Improve Surgical Safety

- Identify a simple set of surgical safety standards that are applicable in all countries and settings and are compiled in a checklist for use in operating rooms
- By testing and disseminating the Checklist and surveillance measures at pilot sites in every WHO region initially, and then to hospitals worldwide.
- Based on the studies implemented by the Alliance
 - WHO implemented a 4 part corrective action plan to improve surgical patient safety around the world
 - The plan included the development of a surgical safety checklist

Example of the First Edition

Today, improved versions of the checklist are used around the world

 World Health Organization			SURGICAL SAFETY CHECKLIST (FIRST EDITION)		
Before induction of anaesthesia		Before skin incision		Before patient leaves operating room	
SIGN IN		TIME OUT		SIGN OUT	
<input type="checkbox"/> PATIENT HAS CONFIRMED • IDENTITY • SITE • PROCEDURE • CONSENT		<input type="checkbox"/> CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE		NURSE VERBALLY CONFIRMS WITH THE TEAM:	
<input type="checkbox"/> SITE MARKED/NOT APPLICABLE		<input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM • PATIENT • SITE • PROCEDURE		<input type="checkbox"/> THE NAME OF THE PROCEDURE RECORDED	
<input type="checkbox"/> ANAESTHESIA SAFETY CHECK COMPLETED		ANTICIPATED CRITICAL EVENTS		<input type="checkbox"/> THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)	
<input type="checkbox"/> PULSE OXIMETER ON PATIENT AND FUNCTIONING		<input type="checkbox"/> SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?		<input type="checkbox"/> HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)	
DOES PATIENT HAVE A:		<input type="checkbox"/> ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?		<input type="checkbox"/> WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED	
KNOWN ALLERGY?		<input type="checkbox"/> NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?		<input type="checkbox"/> SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT	
<input type="checkbox"/> NO <input type="checkbox"/> YES		HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE IN LAST 60 MINUTES?			
DIFFICULT AIRWAY/ASPIRATION RISK?		<input type="checkbox"/> YES <input type="checkbox"/> NOT APPLICABLE			
<input type="checkbox"/> NO <input type="checkbox"/> YES, AND EQUIPMENT/ASSISTANCE AVAILABLE		IS ESSENTIAL IMAGING DISPLAYED?			
RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?		<input type="checkbox"/> YES <input type="checkbox"/> NOT APPLICABLE			
<input type="checkbox"/> NO <input type="checkbox"/> YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED					

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Types of Checklists

- Do- Confirm checklist
 - used for jobs that are performed by memory or habit
 - Typically used for procedures and tasks completed in a specific order
 - Confirms all steps were completed
 - *Coordinating teams , complex tasks, procedural tasks*
- Read-Do Checklists
 - Used as an outline to carry out tasks as they are read, checked off when complete
 - Good for infrequent tasks, tasks with no particular order
 - *Troubleshooting, action plan, preventative maintenance, packing list, workplace inspections*

References

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