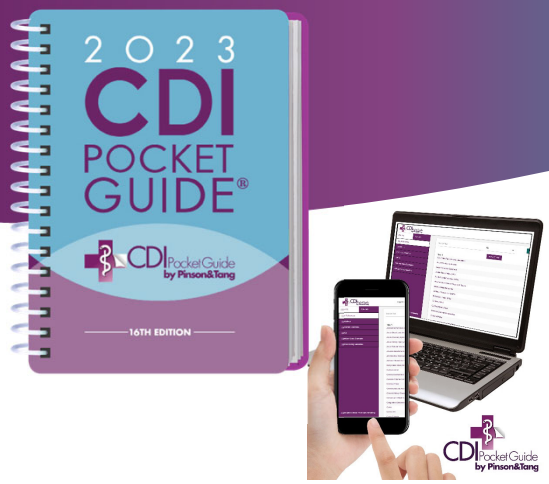
August 25, 2022



CDI Pocket Guide®
Shock

Pinson&Tang

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About Us

Richard Pinson
MD, FACP, CCS, CDIP

Dr. Richard Pinson is a physician, educator, administrator, and healthcare consultant. He practiced Internal Medicine and Emergency Medicine in Tennessee for over 20 years having board certification in both.

Cynthia Tang
RHIA, CCS, CRC

Cynthia brings over 35 years of experience in coding and clinical documentation integrity, and health information management. For over 30 years she has traveled across the country implementing successful and sustainable coding and CDI programs in hundreds of hospitals.

CDI Pocket Guide by Pinson&Tang

We created the **CDI Pocket Guide®** in 2008 because we wanted to provide this information to all hospitals, large or small. At the time, the only way to receive training in this field was with large-scale, expensive consulting projects. We thought we could bring this pocketful of information with the clinical criteria to identify important diagnoses to any individual who was interested in working in the CDI and coding field. Our CDI Pocket Guide® quickly became a best-selling book and an industry standard, and many consider it to be their CDI "bible".

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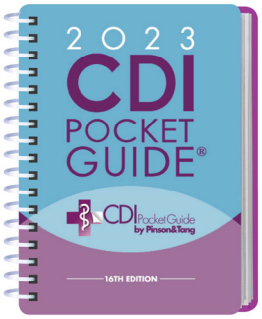

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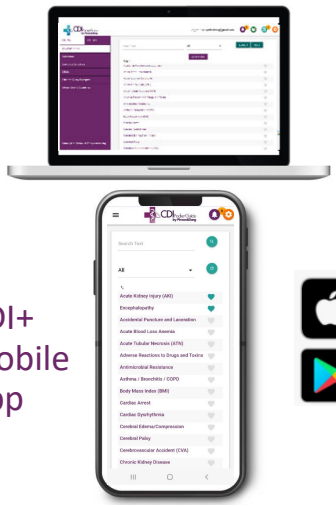

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Agenda

2022 CDI Pocket Guide®
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- ICD-10 Classification
- Definition and Clinical Findings
- Diagnostic Criteria: Adult & Peds
- MAP vs. Blood Pressure
- Treatment
- Postprocedural Shock
- Case Studies
- Q&A

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ICD-10: Shock

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Code	Type of Shock	Causes	
R57.9	**Shock, unspecified**		CC
R57.0	**Cardiogenic**	Inadequate cardiac output due to acute MI, heart failure	MCC
R57.1	**Hypovolemic**	Depletion of intravascular volume: severe dehydration, hemorrhage	MCC
R57.8	**Hemorrhagic, Other specified: (neurogenic, vasogenic)**	Hemorrhagic: Severe hemorrhage Neurogenic: CVA, severe acute pancreatitis Vasogenic: severe sepsis, post cardiopulmonary bypass	MCC
R65.21	**Septic**	Severe sepsis	MCC

Codes R57.9, R57.0, R57.1, R57.8 are symptom codes. The cause, if known, is sequenced first.

Do not use these codes if during or due to surgery (T81.1) or (Excludes 1) if traumatic shock, toxic shock, or adverse effect of drugs.

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ICD-10: Other Shock

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Code	Type of Shock	Causes	
T36-T50 R57.8	**Due to drugs: poisoning** *Use additional code for shock*	Shock due to the improper use of medication, combination with alcohol, overdose	-- MCC
T88.6XXA	**Due to drugs: adverse effect**	Shock due to a medication correctly prescribed and properly administered.	CC
T79.4XXA	**Post-traumatic or traumatic**	Hemorrhage and/or severe SIRS due to trauma	MCC
A48.3	**Toxic shock syndrome**	Toxin-producing staph aureus: 50% is menstrual related, skin wounds	MCC

Code I95.2: Hypotension due to drugs.

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ICD-10: Postprocedural Shock

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Code	Type of Shock	
T81.10XA	**Shock during or resulting from a procedure; surgical; therapeutic misadventure**	CC
T81.11XA	**Postprocedural cardiogenic shock**	MCC
T81.12XA	**Postprocedural septic shock**	MCC
T81.19XA	**Postprocedural hypovolemic or other shock**	MCC

PSI 04: Death Rate among Surgical Inpatients with Serious Treatable Complications includes T81.1- and R57 codes. Not included in CMS Pay for Performance programs.

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Shock: Definition

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Shock is a **life-threatening condition** that occurs when the body is not getting enough blood flow (inadequate tissue perfusion).

- Decreased oxygen delivery and/or increased oxygen consumption

Lack of blood flow means the cells and organs do not get enough oxygen and nutrients to function properly.

Patients typically have **severe hypotension** that is **unresponsive** to IV fluids.

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Clinical Findings

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- Hypotension
- Altered mental status
- Tachycardia
- Tachypnea
- Pale, cool, clammy, cyanotic skin
- Cool extremities
- Weak peripheral pulses
- Organ failure: kidney, liver

- MAPs < 70
- Hyperlactatemia
- Metabolic acidosis
- Decreased urine output
- Delayed capillary refill > 2 sec
- Temperature instability: hyperthermia, hypothermia
- Cardiac output – typically reduced (monitored after major cardiac surgery)

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Diagnostic Criteria

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Adult

Hypotension **refractory** to effective fluid resuscitation:

- Systolic blood pressure (SBP) < 90 mmHg, or
- Mean arterial pressure (MAP) < 70 mmHg, or
- Decrease baseline SBP of ≥ 40 mmHg or more

OR

Lactate level > 4 mmol/L is equivalent to shock without blood pressure parameters (when elevated lactate not due to another underlying cause)

Pediatrics

Hypotension **refractory** to effective fluid resuscitation:

- Age 0–28 days = SBP < 60 mmHg
- Age 1–12 mos = SBP < 70 mmHg
- Age 1–9 yrs = SBP < 70 mmHg + 2x age
- Age ≥ 10 yrs = SBP < 90 mmHg

OR

Lactic acidosis (any age):
Elevated anion gap + elevated lactic acid

*Pediatric criteria use SBP not MAP.

Refractory

No response to 30-40cc/kg of normal saline infusion over 1 hour
Pediatrics: Up to 60cc/kg over 1 hour

Example: For 80 kg man = 2400 to 3200 ccs over 1 hour

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MAP vs. SBP/DBP

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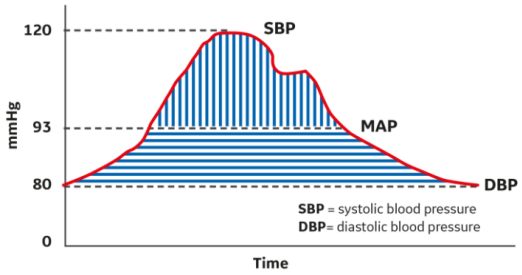
Systolic blood pressure (SBP) is the **highest** blood pressure reached during systole (pump)	**Diastolic** blood pressure (DBP) in the **lowest** blood pressure during diastole (rest)

Mean arterial pressure (MAP) is the **average** arterial pressure throughout one cardiac cycle, systole, and diastole.

Calculation: 2x diastolic + systolic divided by 3.

MAP had traditionally been measured by intra-arterial monitoring. Current external BP monitors now have MAP.



MAP is primarily used to monitor for and determine shock following surgery.

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Treatment

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- **IV fluid resuscitation**
- **Vasopressor** infusion such as norepinephrine or dopamine
- Correction of underlying cause
- Supplemental oxygen
- Blood transfusion
- Albumin
- Corticosteroids

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Shock Following Surgery

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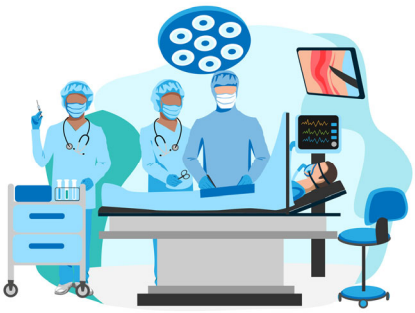
Shock in the postoperative period is usually due to:

- Hemorrhage
- Cardiac failure
- Vasoplegia (distributive)

Major surgical complication identified by:

- Signs and symptoms of shock
- Fluid resuscitation and vasopressors



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Routine Postoperative Management: Surgery

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Postsurgical hemodynamic management: Inotropes, vasopressors, and/or vasodilators are often used and necessary in the postoperative period, particularly in the initial 6 to 12 hours following ICU admission and then weaned if hemodynamic goals are maintained.

Post cardiopulmonary bypass (CPB): In general, these drugs are used to treat left ventricular and/or right ventricular dysfunction and/or vasoplegia. As the pathophysiologic consequences of CPB resolve, these medications are weaned, allowing removal of invasive monitors to facilitate mobility.

Routine management: Not cardiogenic or vasogenic shock.

Look for:

- Signs and symptoms of shock
- Fluid resuscitation and vasopressors
- Decreased cardiac output/index
- Severe hypotension

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Case Study #1

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66-year-old male patient admitted 4/21 to 4/28 with severe AV regurgitation for **aortic valve replacement**. PMHx: CAD and MI, type 2 DM, COPD, retroperitoneal fibrosis with bilateral ureteral stents, anxiety disorder (benzodiazepine dependent), DVT, hypertension, CVA, combined CHF. Pre-procedure VS BP 105/77, P 67, R 18, Sp02 95%.

4/21 OP (Start 1209, Finish 1457): Patient placed on cardiopulmonary bypass, AV replacement was performed. The patient was weaned from CPB without complication. Patient tolerated the procedure well and was transferred to the ICU in stable condition.

4/21 to **ICU** (**1514)**. BP 97/75, P 81, intentional sedation and mechanical ventilation per ETT, hemodynamically stable, euvolemic, on vasopressor support (Epinephrine drip).

(2200) MAPs 65-91, Epinephrine weaned and stopped.

4/22 (0600) MAPs drifted down but stable at 64-68 through night, extubated to nasal cannula.

(0800) MAP 58-64**,** cardiac output less than 4, cardiac index less than 2.2, JP and chest tube drainage 500ml since surgery, occasional PVCs noted. Treatment: Fluid resuscitation with 0.9% NaCl then restarted Epinephrine and gave albumin bolus. Progress Note (0800): **Cardiogenic shock.**

(0900) MAP improved to > 65 mmHg, increased SVR

(0930) PVC ectopy increased, ↓ cardiac index and ↓ cardiac output noted, patient developed atrial fib then became bradycardic with pressures 70s/30s, short of breath, clammy/ mottled skin, mild confusion, decreased urine output, lactate 2.8, O2 per face mask, Ventricular pacing resumed, albumin bolus given, Epinephrine drip cont., IV amiodarone started.

(1030-1430) MAP > 65, Epinephrine discontinued, MAP remained > 65 off pressors. Treatment for afib continued.

Progress Note (1430): Cardiogenic shock resolved.

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Case Study #2

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69-year-old with ASHD admitted 3/18 for elective CABG.

3/18 CTS Postop PN: This patient is post-cardiac surgery at risk for life-threatening deterioration. Needs ICU care for Acute Respiratory Failure Management, Ventilator Management, Management of Cardiac Support Infusions, Invasive Hemodynamic Management, Management of Cardiogenic Shock, Management of Vasogenic Shock, and Comprehensive Pain Management.

3/19 CTS PN: No issues overnight, VSS, CI: 2.9-3.3 (Dob 3), CT: 480cc, CXR stable, UOP: 1.0L, I/O: +988, Plan: Wean dobutamine.

3/19 CTS PN: No acute events overnight. He has been requiring a little bit of blood pressure assistance with Levophed. We will attempt to wean this over the course of the day. His serum creatinine is 1.2. Continue with dobutamine of 3 and likely send him out of the ICU on this.

3/18: MAP 57-60 (1540-1543), cardiac output normal, SpO2 96-100% on 4L.

3/19: MAP 50-59 (2145-2147), cardiac output normal, SpO2 = 100% on 3L, then RA rest of stay.

He had a pleural effusion that was not being drained adequately by her intra-op drains so IR was consulted for placement of a left pleural drain. This improved his pleural effusion.

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Case Study #3

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Pt admitted on 7/23 for AICD discharge – frequent VT Storm, NSTEMI from VT, h/o CAD, HTN, HLD, OSA, ICM.

Pt with temp, labile MAPs requires Levophed. Intubated for clinical deterioration, requires higher level of FIO2 and peep, appears to be volume overloaded. CXR suggestive of infiltrates, UA + pyuria, UTI; Urine/blood cultures NGTD. Started Vanco and cefepime.

Labs: WBC 6.4–13.8; Lactic acid 1.5–1.1; Procal < 0.05, 0.07; Urine, blood, sputum cultures negative.

H&P Dx: Septic shock with acute hypoxic resp failure from likely CAP, possible UTI. CAD with HFrEF with exacerbation. Now manifesting SIRS with persistent fever/oliguric, AKI and progressive hypotension requiring pressors.

DC Summary Dx: Septic shock vs. cardiogenic shock with acute hypoxic respiratory failure.

Pt **transferred** to tertiary center to assess shock state and better manage VT in the event of reoccurrence.

Question: Can we support septic shock in the case of a denial? Likely CAP, possible UTI was not brought over to the DC Summary. What are the clinical differences between septic shock vs. cardiogenic shock?

Temps: Day 1: 97.9-99.5, Day 2: 100-101.7, Day 3: 100.9-101.1-100.5.

TX: Vancomycin and Cefepime (7/24-7/27).

CXR x 5: Day 1: Bilateral infiltrates and effusions; Day 2: Bilateral pleural effusions with atelectasis, unchanged; mild pulmonary vascular congestion; Day 3: Bilateral pleural effusions and consolidation; Day 4: No significant interval change in the appearance of heart and lungs.

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Question #1

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Please discuss the situation of shock vs. medication side effect requiring vasopressor. What category of shock would that fall under? Toxic shock or other shock?

For example, a patient presents hypotensive and required low dose vasopressor for a day or two to support the hypotension. The attending, however, did not document any dehydration or volume deficit, and no signs of infectious process. Therefore, the patient doesn't fit into one of the major categories of shock like hypovolemic shock, hemorrhagic shock, septic shock, cardiogenic shock, etc.

In another example, the hypotension was documented as being caused by polypharmacy sedatives taken by mildly confused patient at home.

Is this shock or only a side effect of the polypharmacy drugs taken? If shock, what type of shock would it be classified as?

Shock due to a medication side effect =

Shock due to drugs:
- Adverse effect: T88.6XXA
- Poisoning: T36-T50, R57.8

For a patient who is hypotensive due to sedatives and/or low dose vasopressors given but does not meet the criteria for shock, assign code I95.2, Hypotension due to drugs.

If meets the criteria for shock but no specified cause, assign code R57.9, unspecified shock.

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Question #2

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In the neurosurgical unit, spinal trauma and spinal surgical cases are put on Norepinephrine drips to keep MAP above 70 to make sure the spinal cord was perfused well.

Sometimes the Norepi was running from the OR. In some cases, the systolic BP was 90 and then the Norepi drip.

Should a query for shock be submitted in these situations?

Unless the patient has signs and symptoms of shock and meets the diagnostic criteria for shock, this represents normal postoperative care.

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Question #3 – Septic shock

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Can septic shock be coded without documentation of "sepsis"? In the case below, septic shock R65.21 was not assigned as a secondary diagnosis because the provider had not documented "sepsis."

Patient was admitted with COVID pneumonia and acute respiratory failure. The provider had documented in H&P possible sepsis. Pt was hypotensive, tachycardic, WBC 13.1, LA 1.6, and placed on BiPap for acute resp failure on admission. Nine days into stay, patient became hypotensive and transferred to the ICU, started on Levophed and placed on ventilator. Patient expired.

Progress notes and Discharge Summary:
"**Septic shock secondary to pseudomonas pneumonia**."

Septic shock due to pneumonia can be assigned codes A41.9 and R65.21 without documentation of "sepsis" separately. The word "septic" confirms sepsis is present. "Shock" is acute cardiovascular failure.

ICD-10 Index: Septic – *see condition*.
Shock, septic (due to severe sepsis) = R6521.
The words in the parentheses (due to severe sepsis) are "non-essential modifiers" which are supplementary words that may be present or absent in the statement of a disease without affecting the code number to which it is assigned.

ICD-10 Tabular: Subcategory R65.2, Severe Sepsis, includes "Infection with acute organ dysfunction". OCG states: "Septic shock generally refers to circulatory failure associated with severe sepsis, and therefore, it represents a type of acute organ dysfunction." In this case we have an infection "pneumonia" with "acute organ dysfunction," therefore, R65.21 is the appropriate code in this situation.

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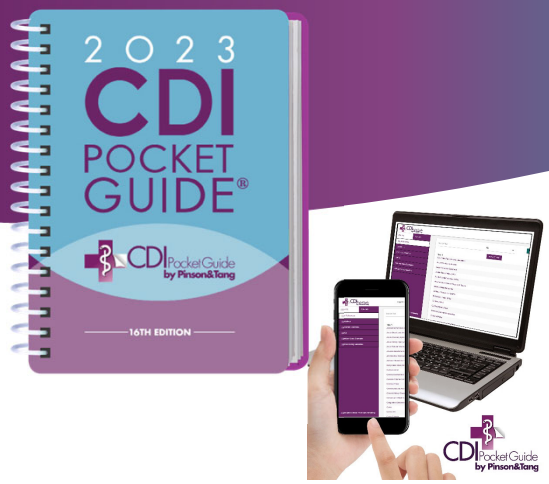

Q & A

THANK YOU!

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