

Transcutaneous Pacing

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PHILIPS

Performing Transcutaneous Pacing

Prepare the patient

Make sure the patient understands the procedure. Sedation may be necessary to improve tolerance of transcutaneous pacing.



Clean and dry skin

If hair prevents good pad contact with the skin, shave the area before applying pads. Be sure to avoid breaking the skin. Follow the manufacturer's directions on the pad pouch.



Apply pads

Apply pads to the patient, preferably using anterior-posterior placement. Do not reverse the pads. Connect the pads to the defibrillator/monitor.



Pacer

Turn the pacer functionality on

Activate pacing functionality. Each QRS complex should have a dot marker associated with it. If not, adjust the ECG size or select another lead. Leads aVL or V₁ are recommended with anterior-apex pad placement.



Mode

Select mode (demand or fixed)

Demand pacing is recommended. The ECG monitor must use a minimum of a 3-wire system for demand pacing. Adjust the rate to the desired number of paced pulses per minute (ppm).



Start Stop



▼ Rate ▲



▼ Output ▲

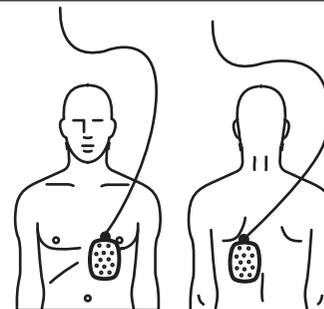
Capture the heart rate

Start the pacer. Increase the output (mA) until pacer spikes are visible in front of each QRS complex and capture has occurred. Then, decrease the output to the lowest level that still maintains capture.

Evaluate the patient

Did the patient improve with capture? Evaluate BP, SpO₂, and pulse rate. If hemodynamic monitoring is available, evaluate stroke volume and SvO₂.
NOTE: Capture alone does *not* guarantee the cardiac output has improved.

Anterior-Posterior Placement for Pacing (Standard)



Anterior-Apex Placement for Pacing (Optional)



Pacing Modes

Demand (synchronous) mode is the preferred means of pacing as it paces only when the patient's heart rate falls below a level set by the clinician. This mode avoids problems such as a pacer impulse landing on a T-wave and possibly causing a ventricular dysrhythmia.

Fixed (asynchronous) mode paces at the rate set by the clinician regardless of the patient's heart rate. This mode is not the preferred means of pacing and is usually reserved for when (1) the pacer cannot sense the heart rate or (2) when motion artifact prevents the pacer from sensing the heart rate.

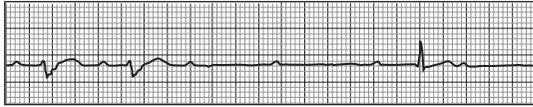
Transcutaneous Pacing

About Transcutaneous Pacing

Transcutaneous pacing is the technique of electrically stimulating the heart externally by using a set of electrode pads.

This technique is not as efficient as transvenous pacing because the electrical stimulus (the pads) is not in direct contact with the heart muscle. Transcutaneous pacing is a good temporary solution in an emergency situation to improve a slow heart rate resulting in inadequate cardiac output.

Emergency Indications

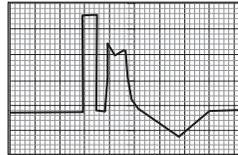


- Slow heart rates (bradycardias) that produce unstable hemodynamics (e.g., low blood pressure, stroke volume, SvO₂)
- Slow heart rates (particularly escape rhythms) that do not respond to drug therapy
- Any condition as a temporary measure in preparation for a transvenous pacemaker
- Non-emergent indications
 - Overdrive pacing (when drugs and electrical cardioversion have failed)
 - Heart blocks in the presence of myocardial infarction

Key Points

Obtaining capture

Increase the output (mA) until the pacer spike is seen in front of the QRS complex. The amount of mA used varies per patient. Increasing the mA slightly above where capture is obtained may help prevent the loss of capture.



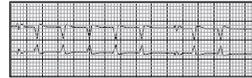
The QRS from the pacemaker will appear wide (like a PVC or ectopic beat), which is normal for a transcutaneous pacemaker.

The muscle under the pads will contract as the pacemaker discharges. However, this muscle contraction does not mean the pacemaker is producing good cardiac output.

Effective capture of the cardiac muscle is seen by improving hemodynamics.

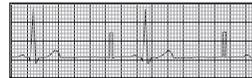
Troubleshooting

If the pacemaker spike is not in front of each QRS complex, then one of two problems may exist.



1) Failure to capture

Failure to obtain capture occurs in demand and fixed mode. Increasing the output (mA) may obtain capture. Be sure the pads have good skin contact. Check for correct pad placement.



2) Failure to sense

This problem occurs in demand mode only and is seen when the pacemaker discharges immediately after the patient's own QRS complex (the discharge occurs in the refractory period of the heart). In this case, the pads are not sensing the patient's heartbeat. Select a different monitoring lead or reposition the pads. Fixed pacing may be indicated.

Patient Preparation

Psychological

- Educate patient about possible discomfort with pacing.
- Instruct patient and family that muscles will twitch with each pacemaker beat.

Sedation

- If sedation is needed (a normal occurrence), be prepared to initiate when pacemaker is activated.
- Discomfort may not be noticed until higher mAs are used.
- Sedation should be for a targeted level (e.g., Ramsey of 2-4).

Skin

- Prepare skin for pad placement (cleaning and shaving, if necessary). Be sure to avoid breaking the skin while shaving.
- Check skin routinely to avoid severe skin irritation.
- If patient's condition allows, move pad placement as necessary to protect skin.

Patient Care

Patient Oriented

Evaluate pads for comfort. Pads should be checked often. Normally they are checked every 30 minutes (to avoid severe skin irritation). They should not be left in the same place for more than a few hours.

Ensure there is a pulse with each QRS complex. Otherwise, electromechanical dissociation may exist.

Pacemaker Oriented

Routinely ensure that the pacemaker is capturing the heart rate with each discharge (check for a pulse with each pacer spike).

Identify the length of time the pacemaker is to be used. Keep in mind that transcutaneous pacing is only temporary, usually less than a few hours.