

AMPUTATIONS OF THE LOWER EXTREMITY

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- Lower limb amputations are the most common of all amputations.
- most common indication diabetes mellitus and peripheral vascular disease.(4 per 1000)
- over 8 million Americans.
- Amputation of the contralateral limb is necessary within 5 years in 30% to 50%

20% percent of below-knee amputations are converted to above-knee amputations.

Over 50% of nontraumatic amputations occur from diabetes-related pathology.

In the diabetic population, firstyear mortality rates after amputation are reported to be as high as 40%, while overall mortality rates range from 60% to 70%.

The level of amputation is always a difficult decision and has a major effect on a patient's quality of life.

Morbidity is more frequent after transfemoral amputations than after transtibial amputations.

Energy expenditure is an important consideration in choosing the level of amputation.

The increased energy consumption of bipedal locomotion for transtibial amputees ranges from 40% to 50%, compared with 90% to 100% in transfemoral amputees.

Patients with transfemoral amputations are less likely to use a prosthesis successfully and consistently than are patients with more distal amputations.

Higher-level amputations, even in children, are associated with a decline in physical function and quality of life.

The most distal level should be chosen where the wound will have the best chance of healing.

This decision process can be augmented using clinical tools such as transcutaneous oxygen tension, determining the nutritional status of patients (albumin level of >3 g/dL, lymphocyte count of >1500 /mL) and preoperative medical frailty.

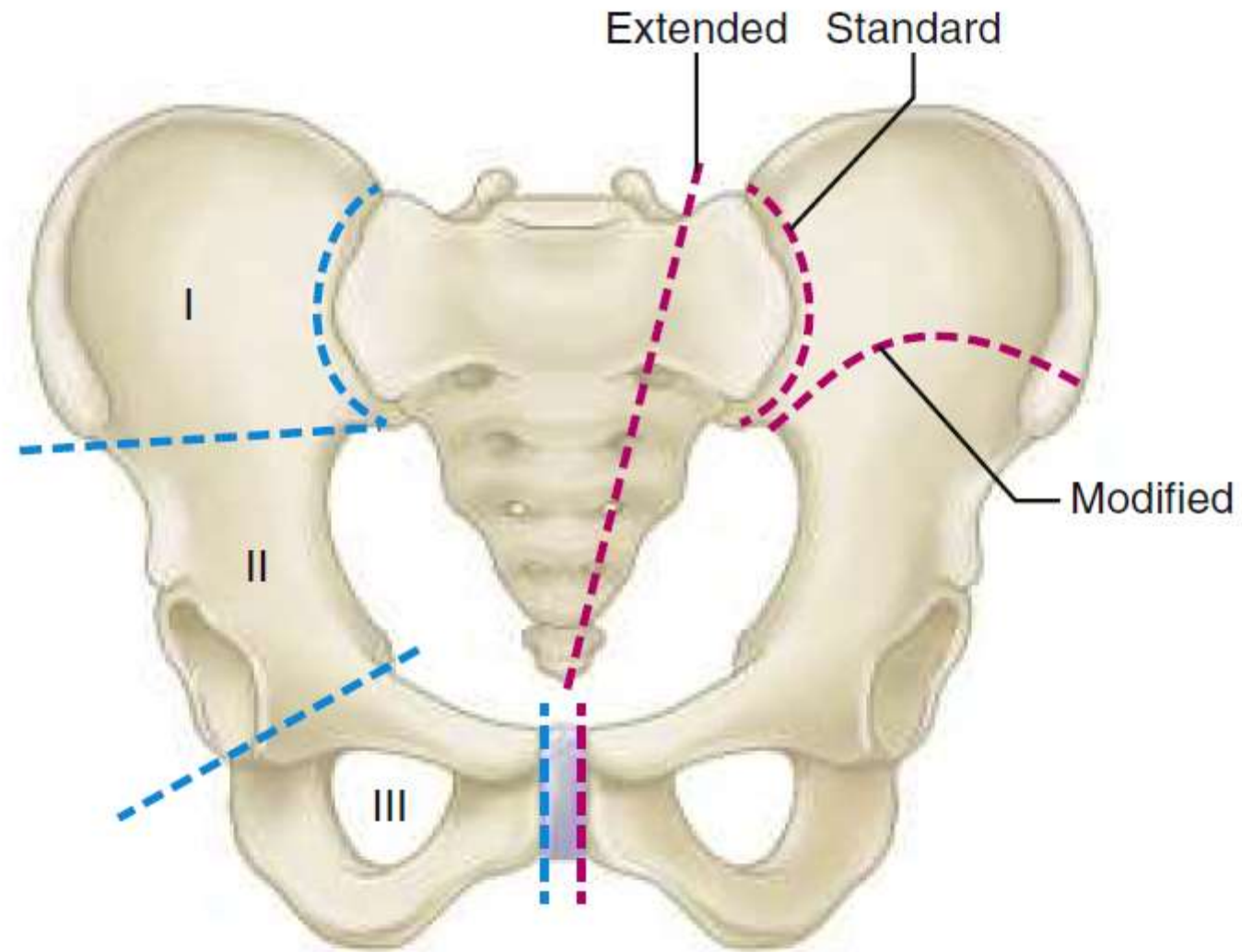
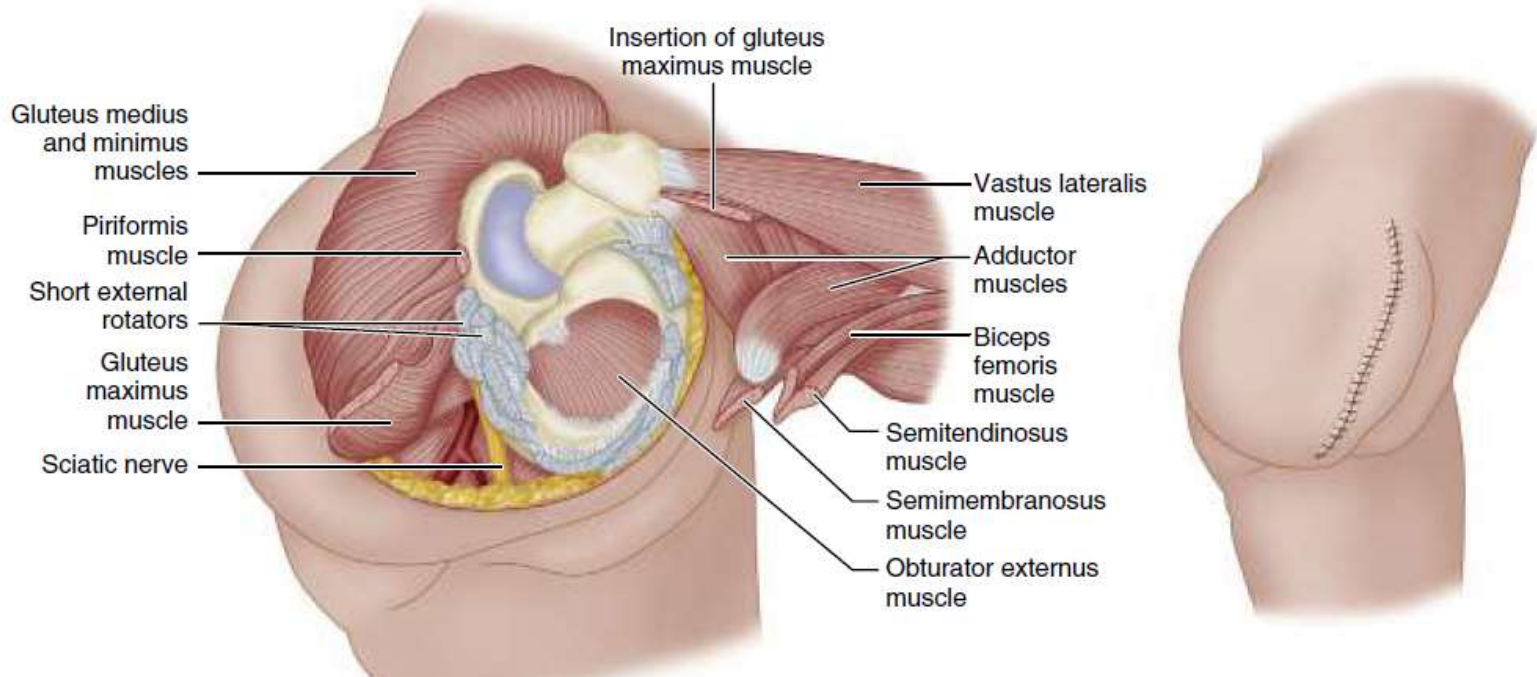
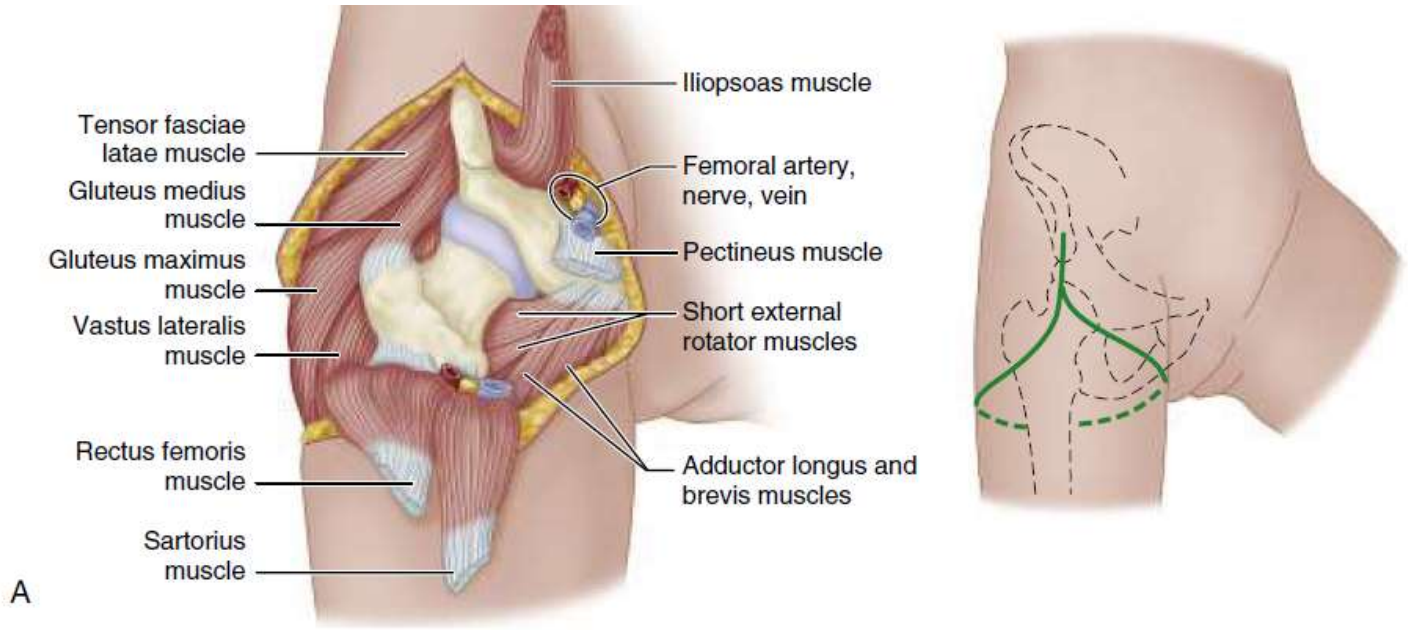


FIGURE 17.2 Modified hemipelvectomy. Bony section divides ilium above acetabulum (*red dotted line*), preserving iliac crest.



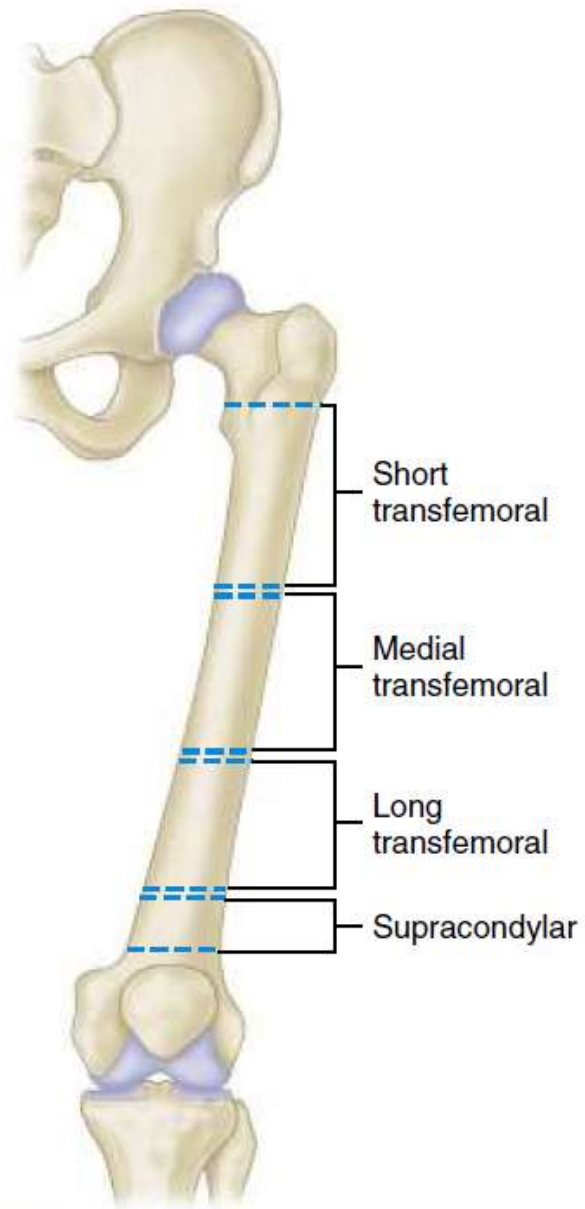


FIGURE 16.8 Levels of transfemoral amputations.

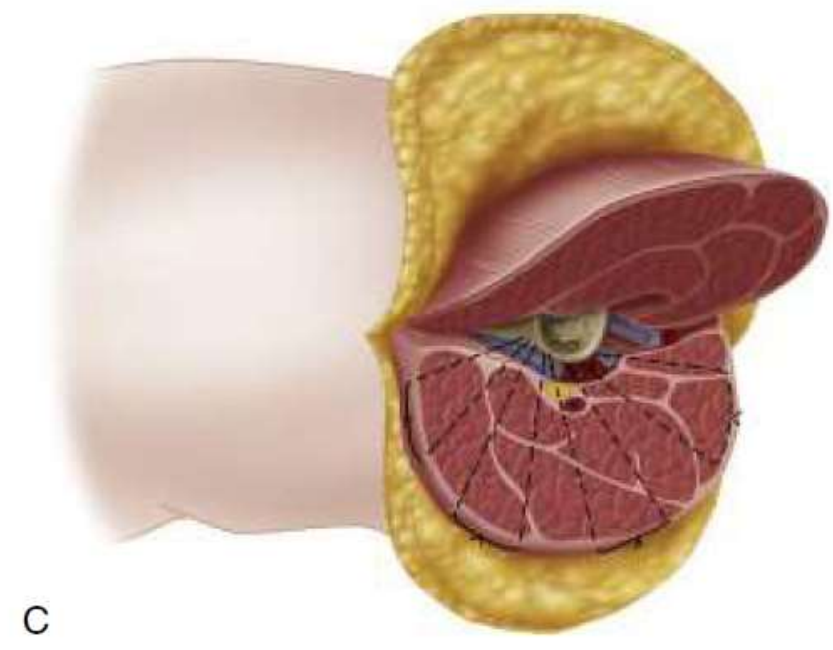
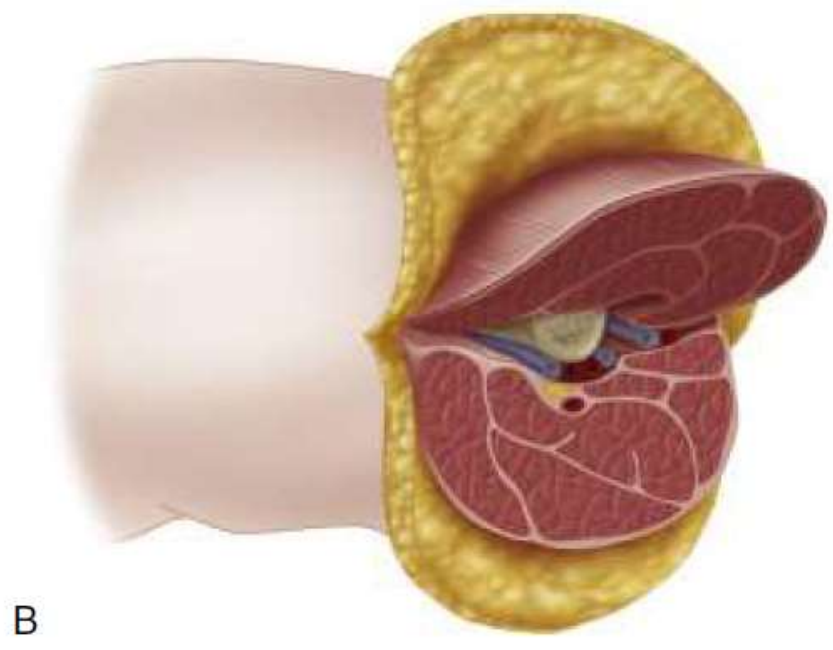
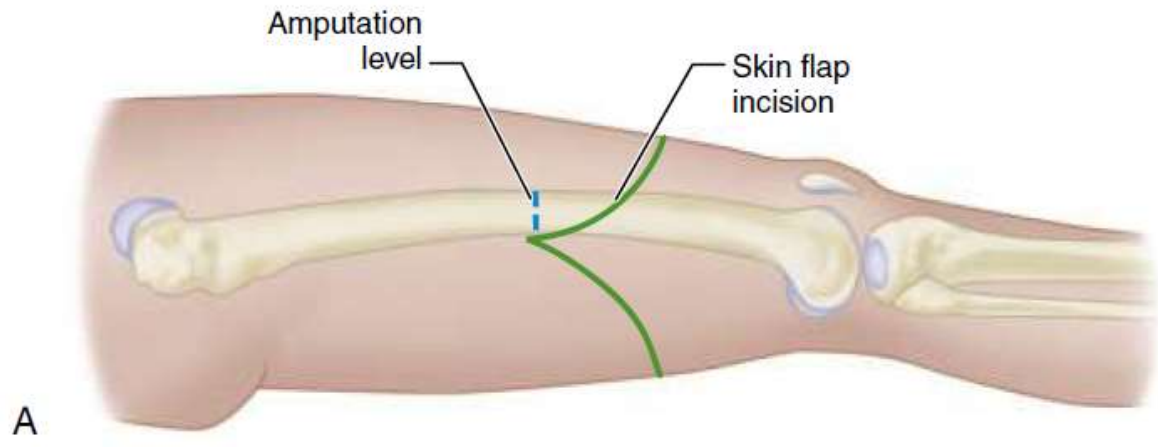
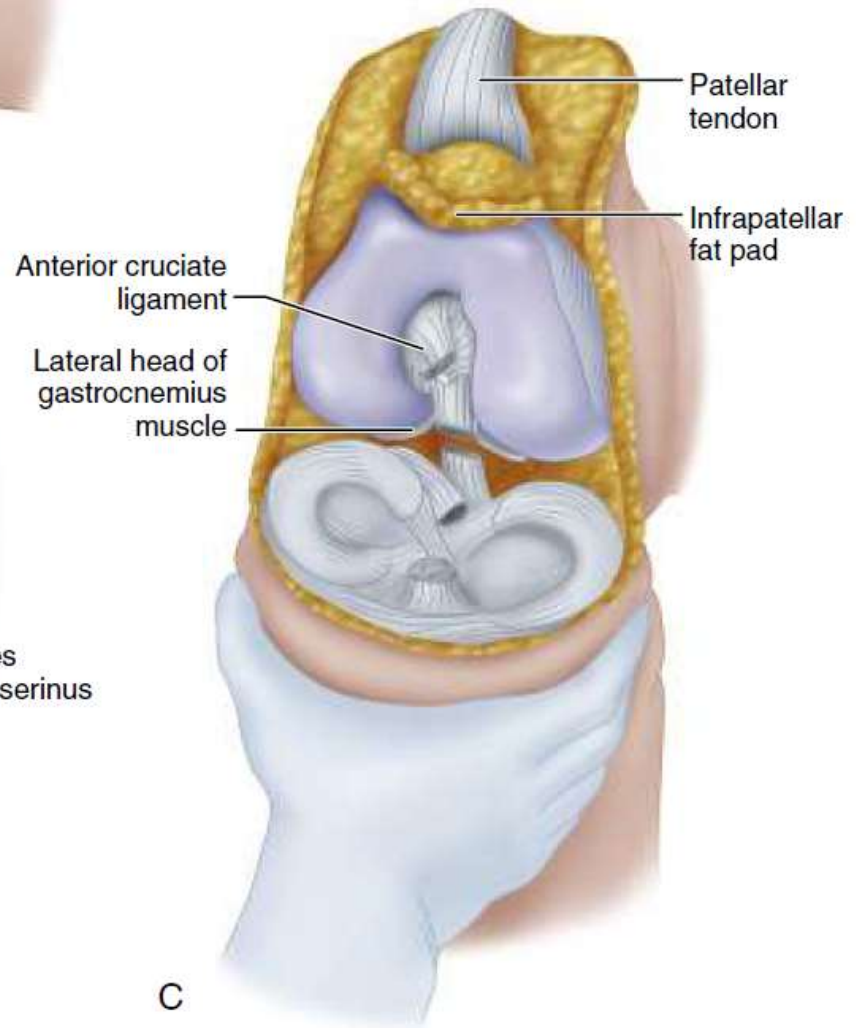
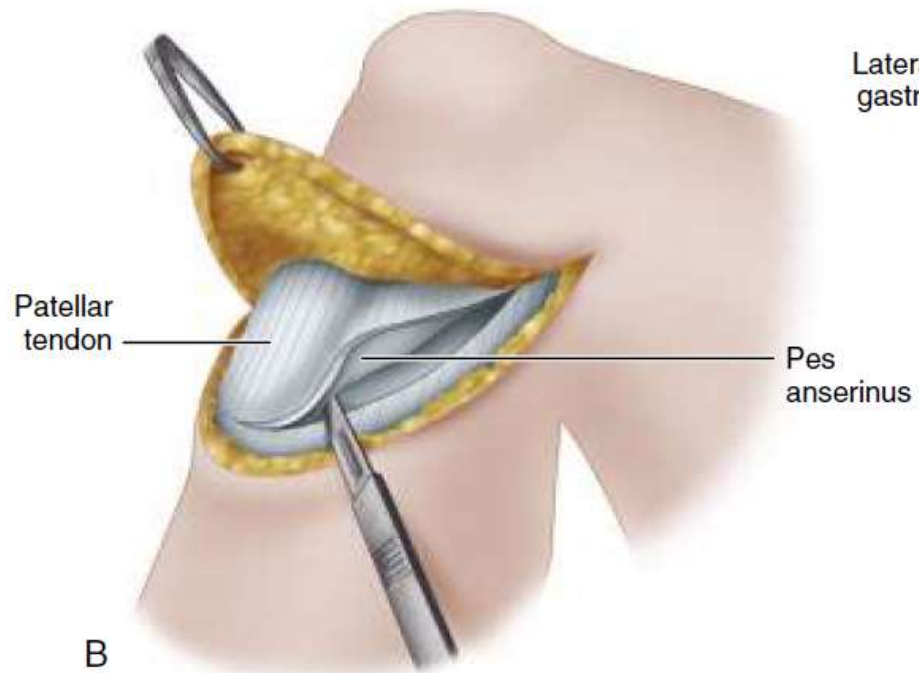
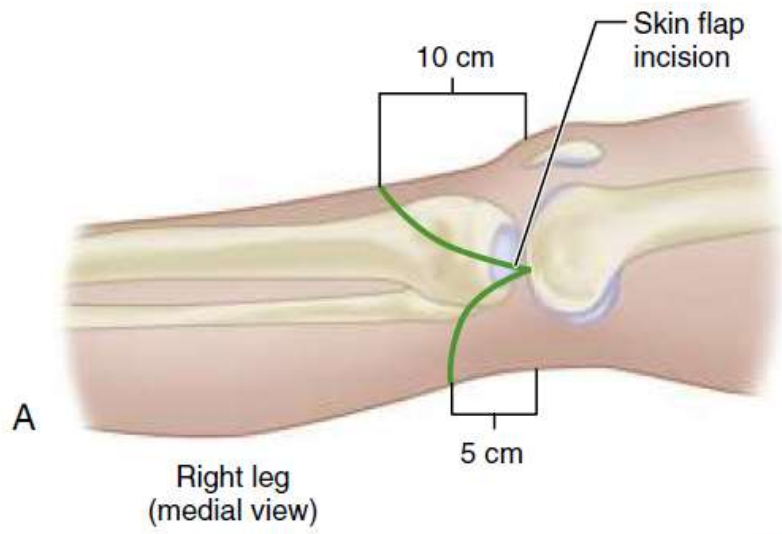
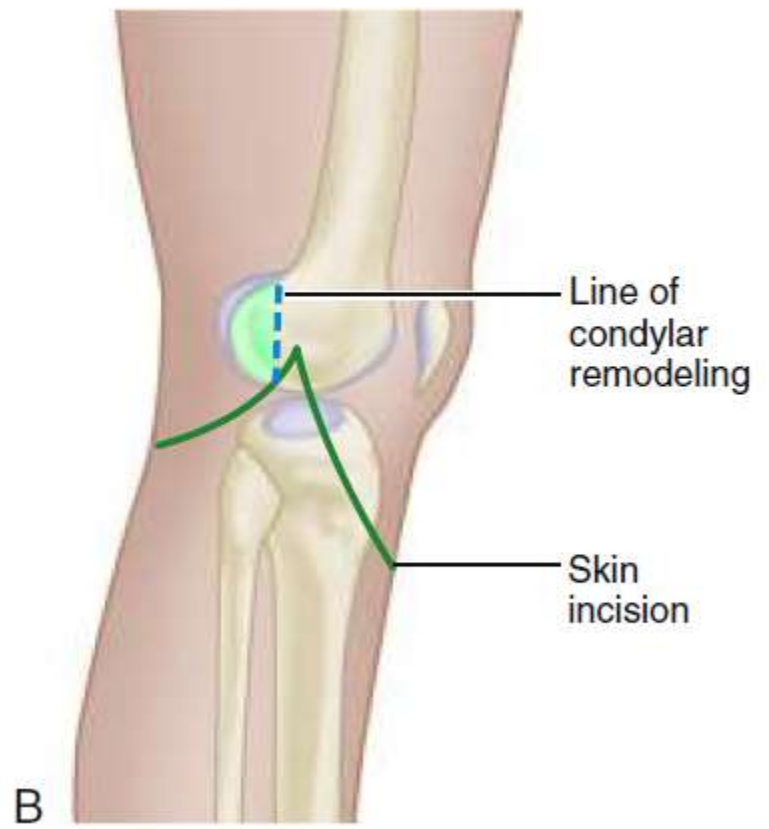
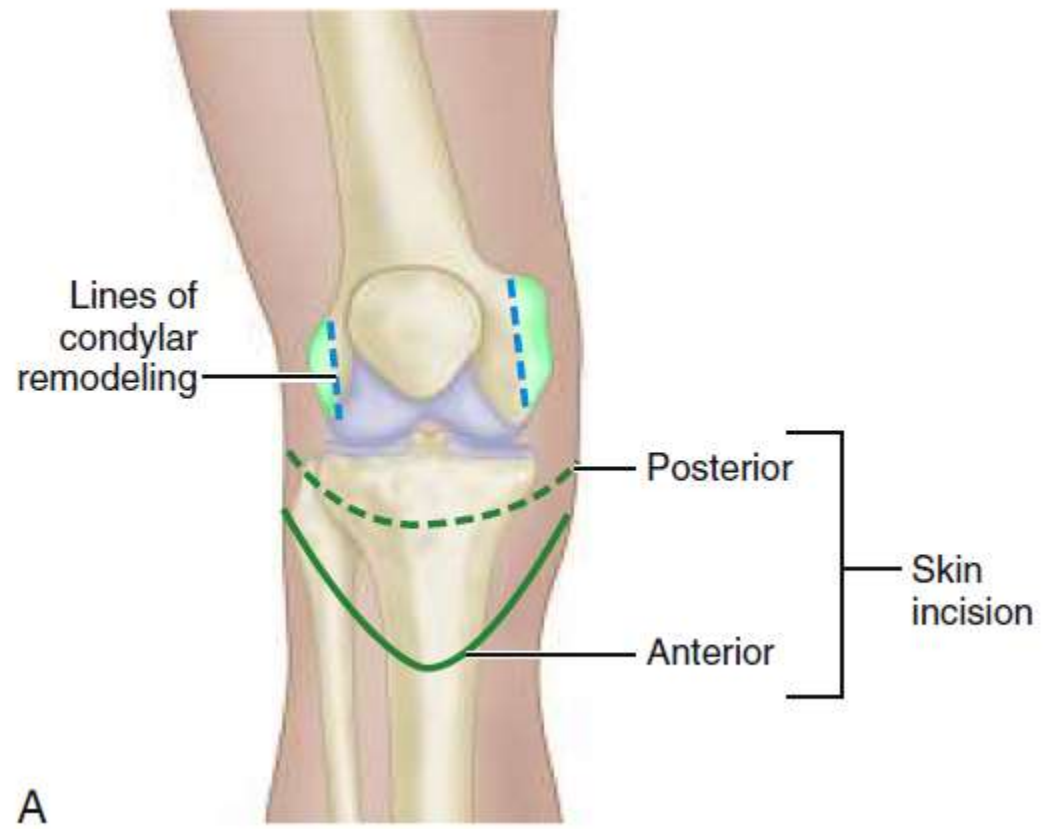




FIGURE 16.10 Attachment of adductor magnus to lateral femur. (Redrawn from Gottschalk F: Transfemoral amputations. In:





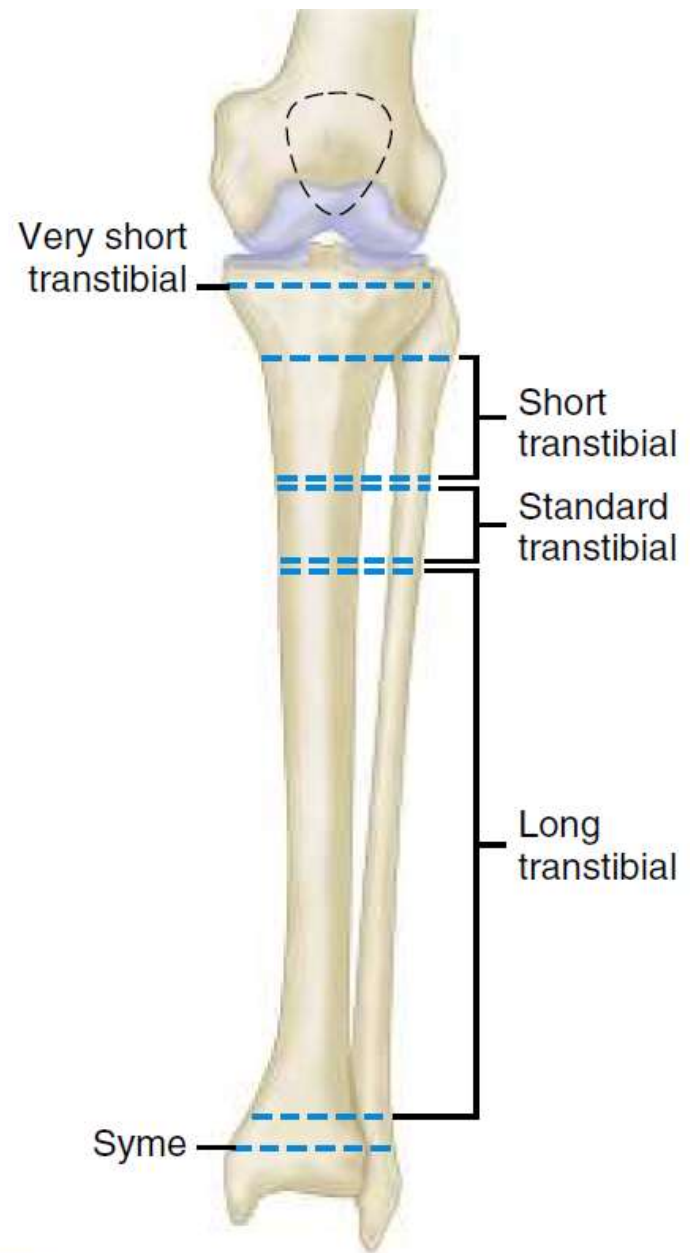
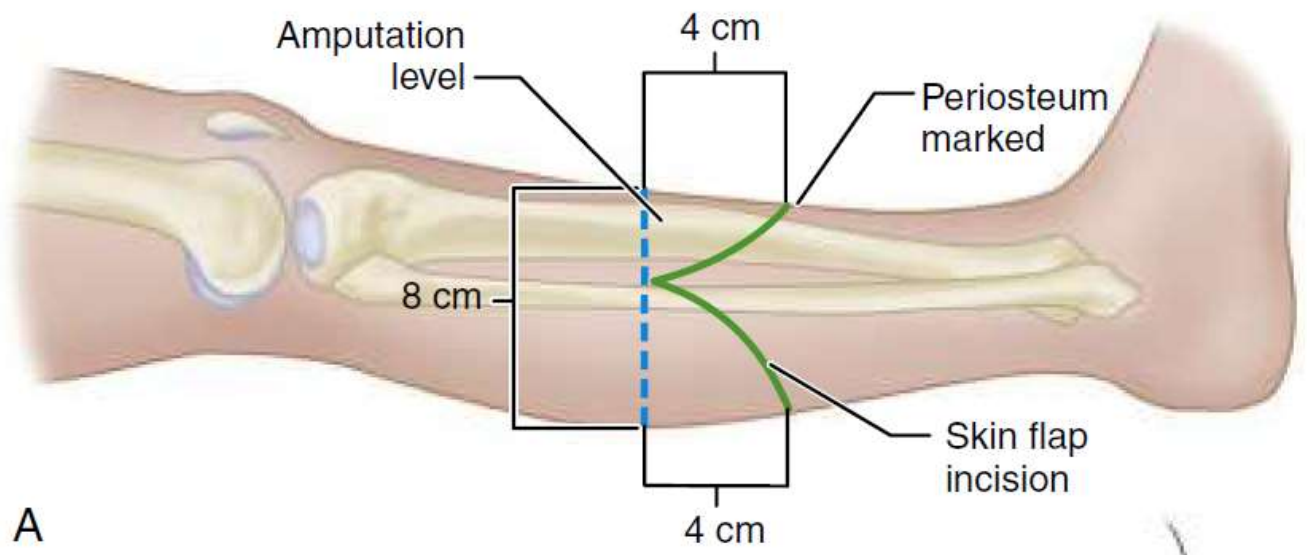
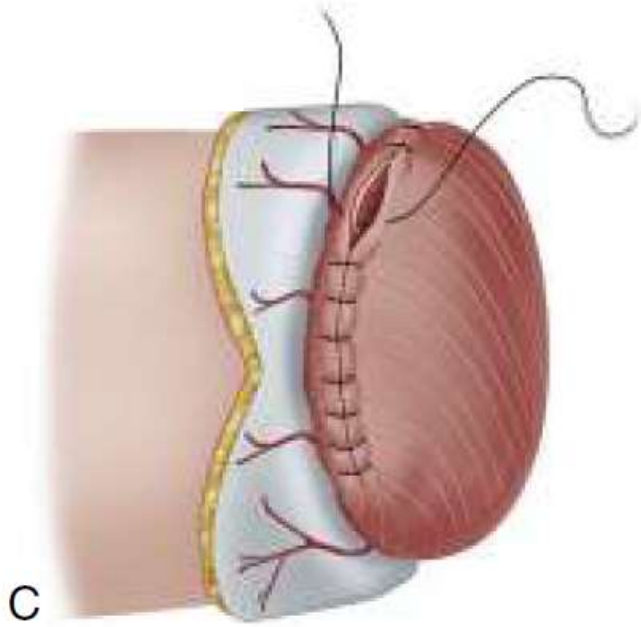
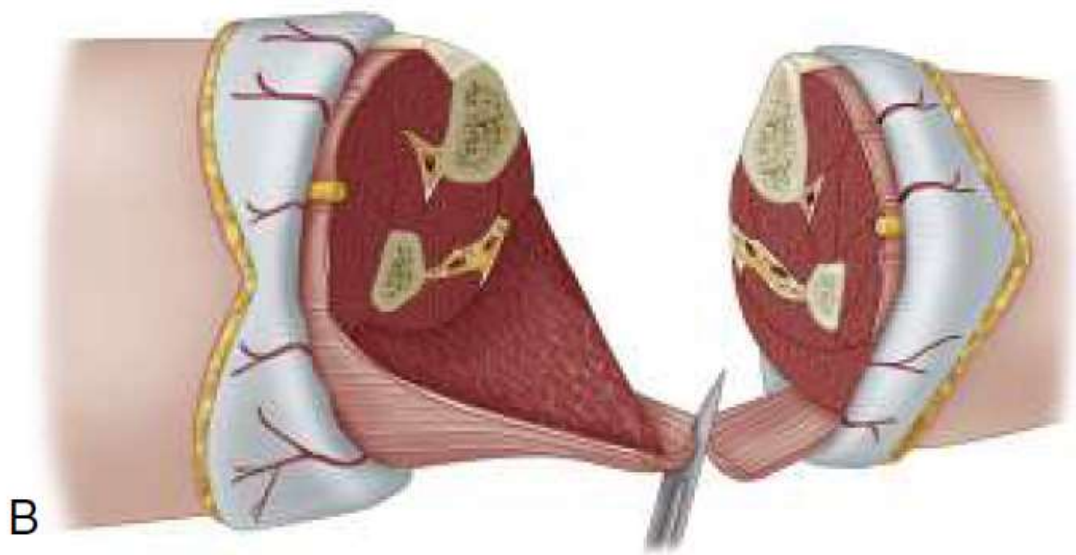
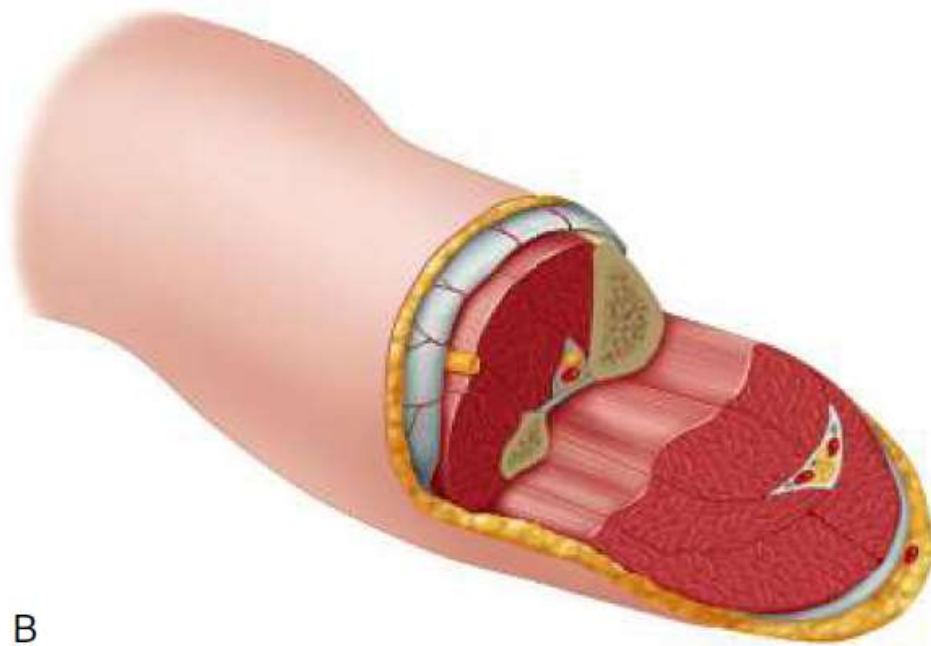
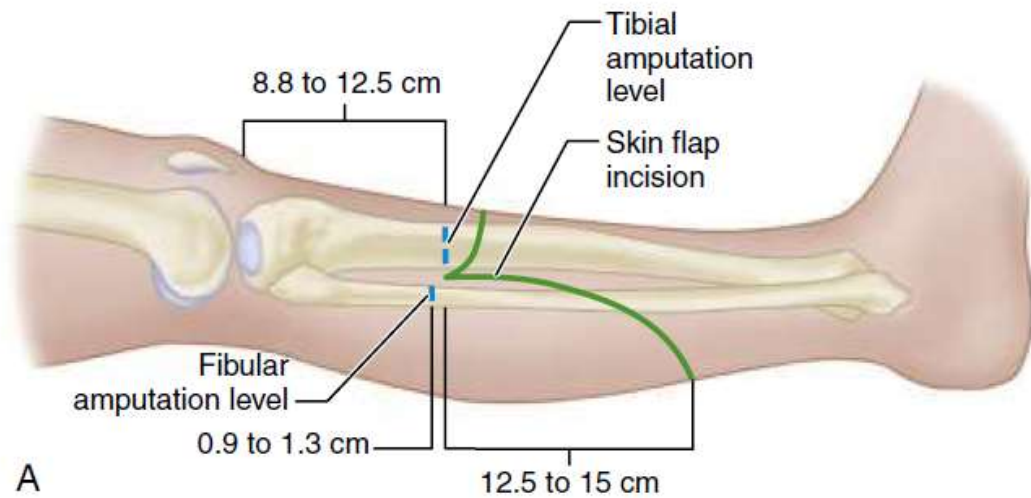


FIGURE 16.1 Levels of transtibial amputations.



A





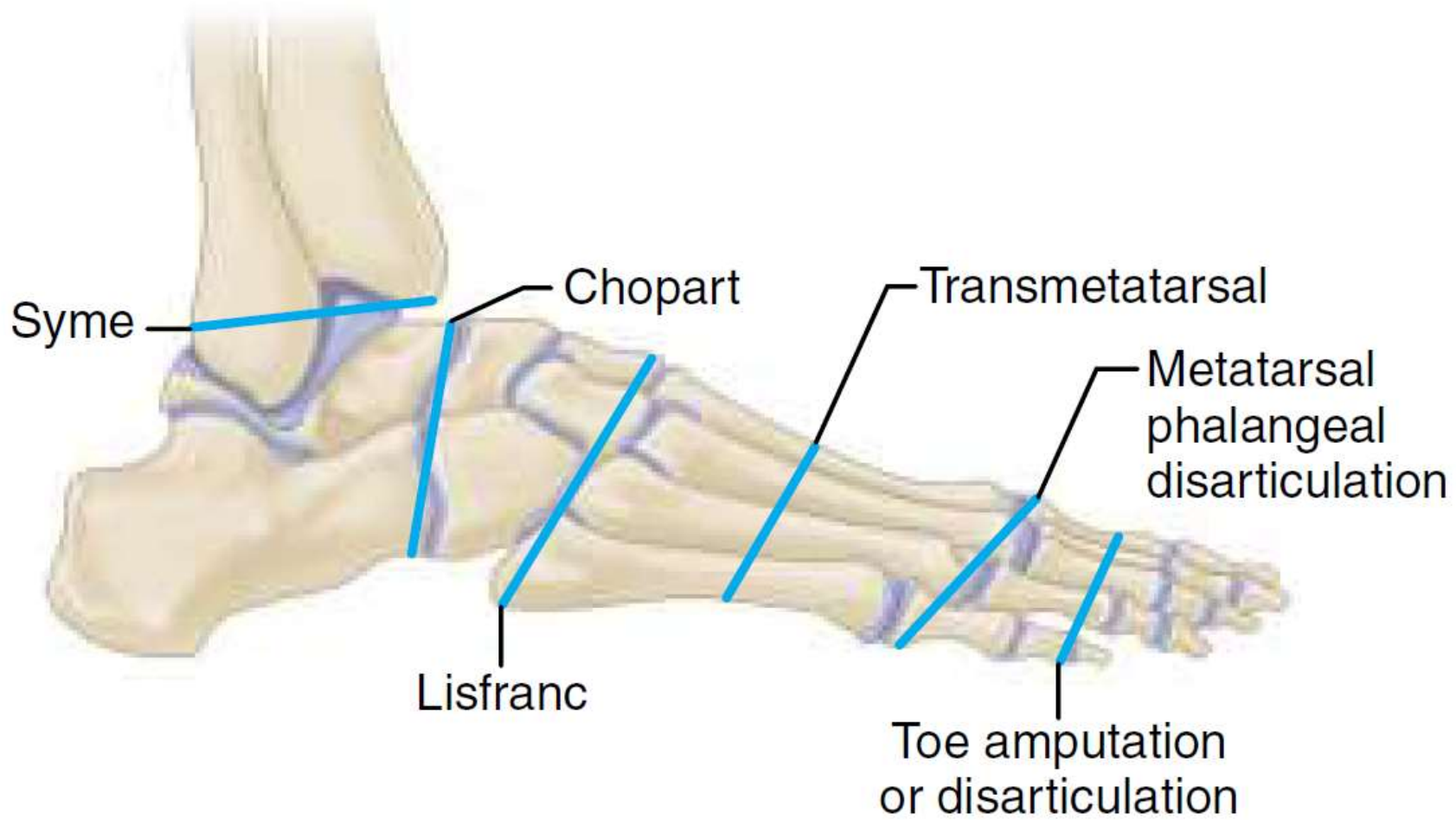


FIGURE 15.1 Levels of partial foot amputation.



FIGURE 15.3 Clinical photographs after removal of fifth toe.



FIGURE 15.4 Custom shoe insert for transmetatarsal amputation.



FIGURE 15.2

Second ray amputation with screw fixation to

narrow the foot.



FIGURE 15.5 Severe equinus deformity after amputation through Chopart joints.



FIGURE 15.6 Amputation through Lisfranc joint. Note recurrent seroma on lateral radiograph.







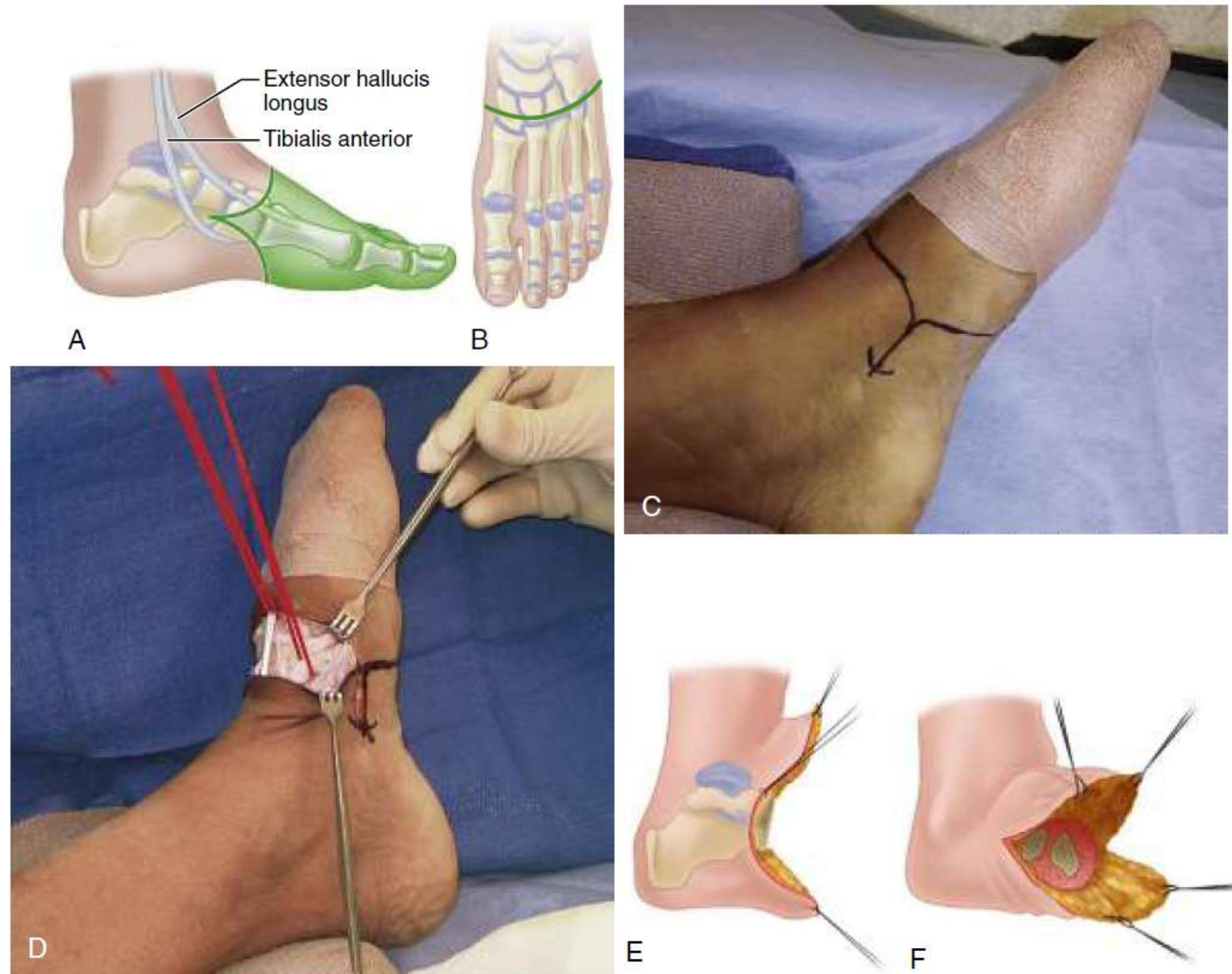
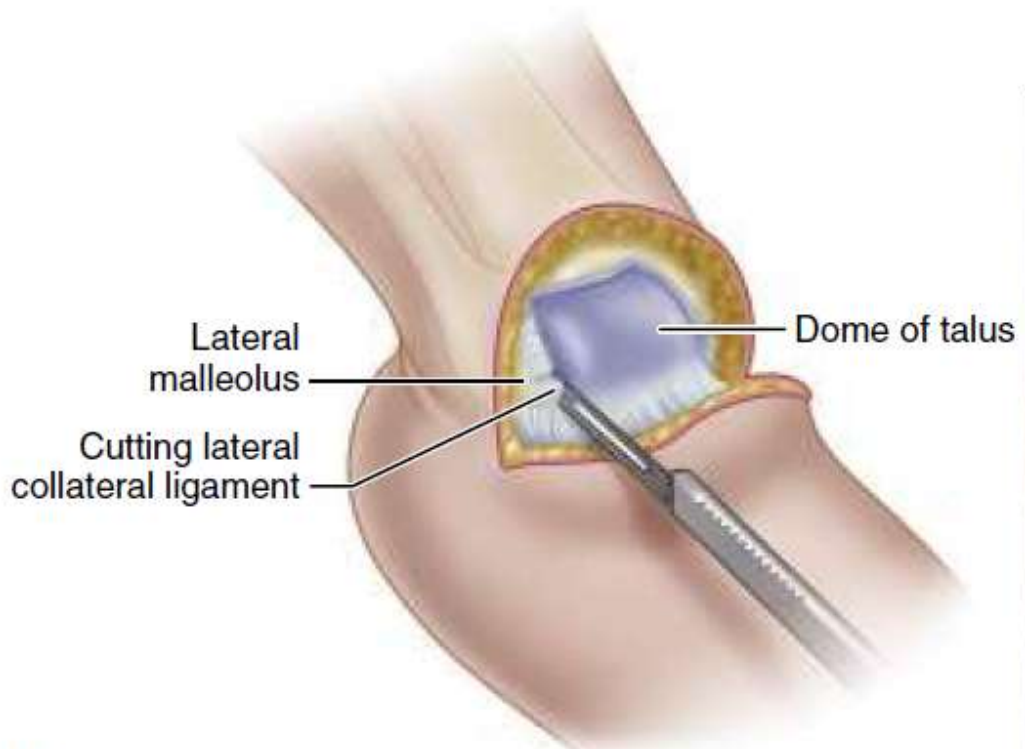
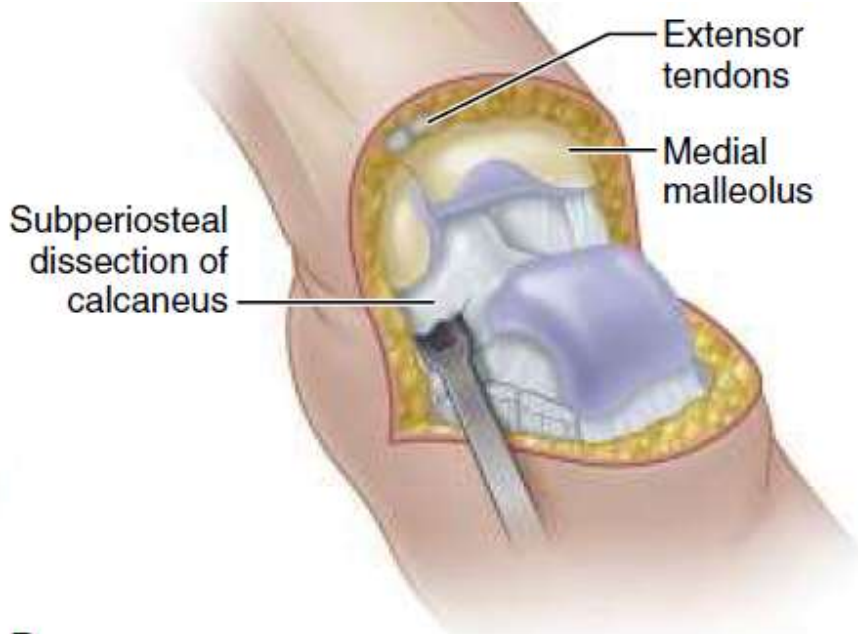
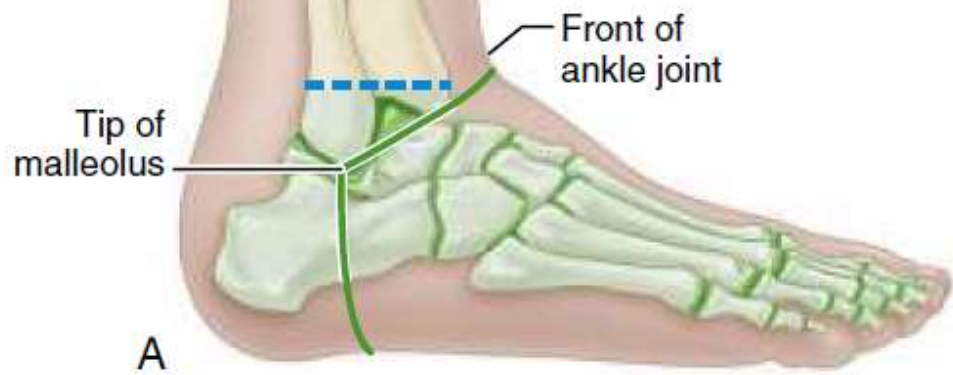


FIGURE 15.19 Chopart amputation. A, Incisions: lateral view of dorsal and plantar flaps.



FIGURE 15.20 A and B, Frontal view of Syme amputation and prosthesis. C and D, Anteroposterior and lateral radiographs of Syme amputation. Note absence of malleoli.



B

D

E

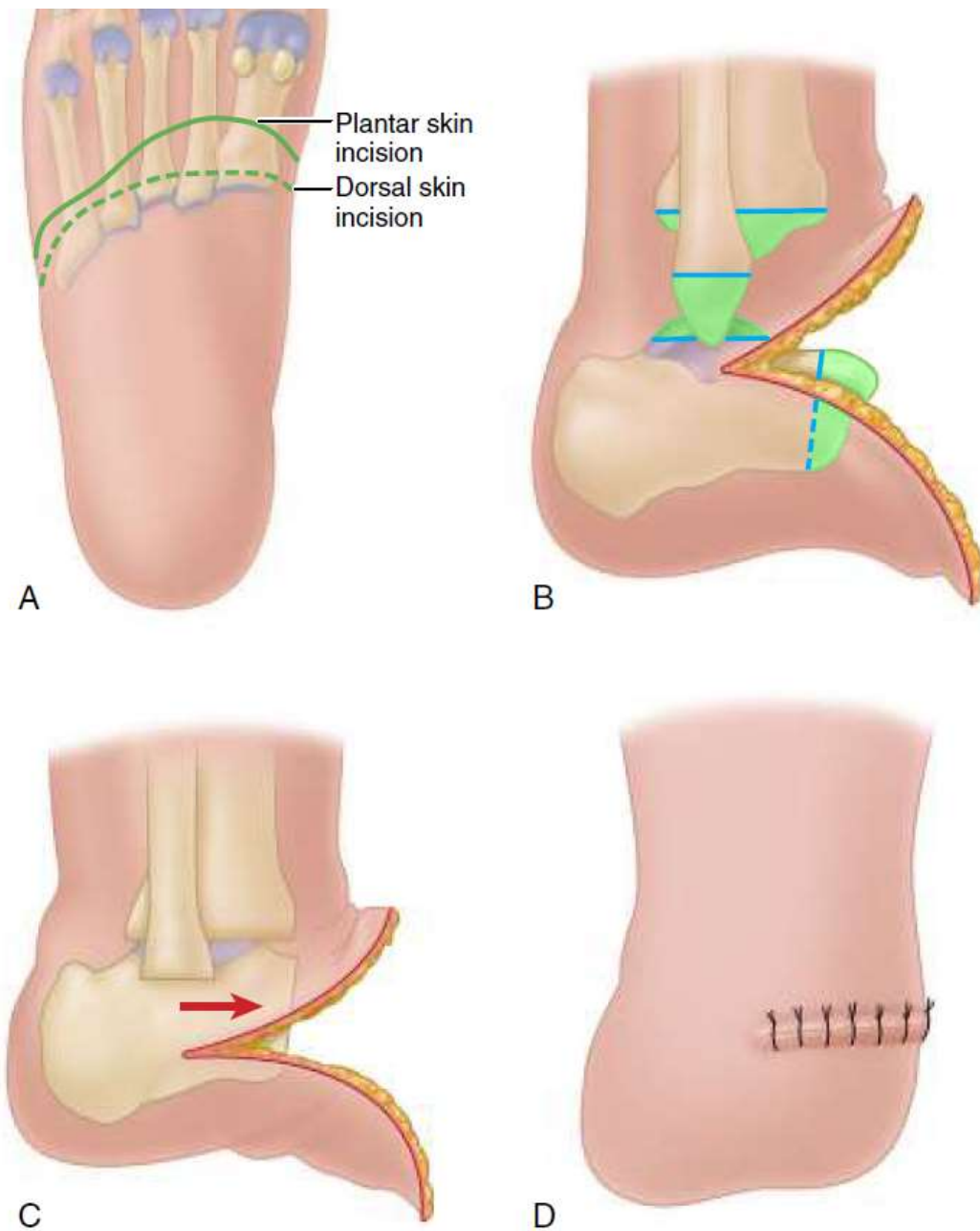


FIGURE 15.23 Boyd amputation with calcaneotibial fusion. **A**, Full-thickness flaps with longer plantar extension in midtarsal amputation. These flaps extend distal to the metatarsophalangeal joints so that wound can be closed without skin tension. **B**, Midtarsal joint disarticulation, talectomy, and partial fibulectomy. **C**, Talus has been excised. Calcaneus and tibial platform prepared for arthrodesis. **D**, Single-layer closure with 2-0 monofilament nonabsorbable suture (over a drain). **SEE TECHNIQUE 15.11.**

REHABILITATION IN NONISCHEMIC LIMBS

Rehabilitation after transtibial amputation in a nonischemic limb is fairly aggressive unless the patient is immunocompromised, there are skin graft issues, or there are concomitant injuries or medical conditions that preclude early initiation of physical therapy.

An immediate postoperative rigid dressing helps control edema, limits knee flexion contracture, and protects the limb from external trauma.

A prosthetist can be helpful with such casting and can apply a jig that allows attachment and alignment for early pylon use.

Weight bearing is limited initially, with bilateral upper extremity support from parallel bars, a walker, or crutches.

The dressing is changed every 5 to 7 days for skin care. Within 3 to 4 weeks, the rigid dressing can be changed to a removable temporary prosthesis if there are no skin complications.

The patient is shown the proper use of elastic wrapping or a stump shrinker to control edema and help contour the residual limb when not wearing the prosthesis.

The physiatrist and therapist can assist in monitoring progress through the various transitions of temporary prosthetics to the permanent design, which may take several months. Endoskeletal designs have been more frequently used because modifications are simpler.

Formal inpatient rehabilitation is brief,
with most prosthetic training done on an outpatient basis.
A program geared toward returning the patient to his or her
previous occupation, hobbies, and educational pursuits can
be structured with the help of a social worker, occupational
therapist, and vocational counselor.

REHABILITATION IN ISCHEMIC LIMBS

Initial postoperative efforts are centered on skin healing.

After transtibial amputation, a soft dressing can be applied but a rigid dressing is preferred and can be used regardless of whether early ambulation is prescribed.

If immediate or prompt prosthetic ambulation is not to be pursued, the stump can be dressed in a simple, well-padded cast that extends proximally to midthigh and is applied in such a manner as to avoid proximal constriction of the limb.

Good suspension of the cast is essential to prevent it from slipping distally and impairing stump circulation.

This may require compressive contouring of the cast in the supracondylar area and a waist band, suspension strap, or both.

The cast should be removed in 5 to 7 days; and if wound healing is satisfactory, a new rigid dressing or prosthetic cast is applied.

If immediate or prompt prosthetic ambulation is pursued, a properly constructed prosthetic cast is best applied by a qualified prosthetist. Success of rehabilitation depends on multiple variables, including cognitive status, premorbid functional level, condition of the upper extremities and contralateral lower limb, and coexisting medical and neurologic conditions.

Early rehabilitation efforts may be geared toward independence in a wheelchair, stump care education, skin care techniques to avoid decubitus ulcers, care of the contralateral intact lower limb, and preprosthetic general conditioning. Weight bearing on the residual limb is usually delayed until skin healing has progressed.

If a more aggressive approach is taken toward prosthetic training, more frequent rigid dressing changes are recommended and possibly the use of clear sockets to allow monitoring of the skin.

Some patients may require further medical evaluation and clearance (e.g., chemically induced cardiac stress test or echocardiogram or vascular studies of the contralateral limb) to evaluate tolerance for prosthetic training.

A pain management specialist may be needed to help treat postoperative phantom limb pain.

Many patients receive inpatient rehabilitation training with subsequent therapy on an outpatient basis or in an extended-care facility or home health setting.

Proposed rehabilitation goals also dictate which prosthetic components would be approved by insurance carriers.

REHABILITATION AFTER TRANSFEMORAL AMPUTATION

A soft dressing for elderly dysvascular rigid dressings and earlier weight bearing with a locked-knee pylon for younger patients.

weight bearing is delayed until sutures or staples are removed.

ambulation with an unlocked knee and less upper extremity support.

For the definitive prosthesis, a variety of prosthetic knee units are available that are lighter and accommodate constant or variable gait cadences and provide good stability during weight bearing.

