Clinical features and classification

Subtypes of melanoma
Clinicopathologic subtypes
Clark et al [1] were the first to divide melanoma into subtypes depending on clinical and histologic features, criteria that were later used by other researchers [2]. The majority of all melanomas fall into the following four subtypes (the World Health Organization [WHO] classification of melanoma) (Table 2.1) [1–5]:

- Superficial spreading
- Nodular
- Lentigo maligna
- Acral lentiginous

Precursor lesions with no penetration of the basal membrane but with a high risk of transforming into melanoma are called “melanoma in situ” or “lentigo maligna.” The superficial cells of the primary lesion, either intraepidermal or just below the basal membrane, determine the classification of melanoma. Lesions without pigment are classified as “amelanotic” [1]. Nodular and acral lentiginous melanomas have the poorest 5-year survival rates among all histological subtypes (69.4% and 81.2%, respectively), mainly because of their higher tumor thickness at the time of diagnosis [6].

The WHO classification includes further subtypes listed in Table 2.2 [7]. One rare melanoma subtype is the desmoplastic melanoma that is often amelanotic and can be difficult to diagnose. Histopathologically, perineural invasion is an atypical feature of this desmoplastic melanoma.
Overview of the four major melanoma subtypes

**Superficial spreading melanoma** is the most common subtype [3]. It frequently presents with diffused borders, a combination of several colors such as brown, black, red, white, or others, and an irregular and elevated surface. It is characterized by laterally spreading melanocytes within the epidermis, making the assessment of the lateral extent of the melanoma difficult [1,2].

**Nodular melanoma** is another common subtype. In contrast to the superficial spreading melanoma, the nodular melanoma presents with a relatively sharp border as the melanocytes extend vertically rather than horizontally [1,2].

**Lentigo maligna or Lentigo maligna melanoma** usually develops on sun-damaged skin (eg, on the head and neck area of elderly patients). Lentigo maligna is a melanoma in situ and a precursor lesion for the lentigo maligna melanoma. Distinction from “actinic melanocytosis” (increased intraepidermal melanocytes secondary to chronic sun exposure) can be difficult [2]. Contrary to the melanoma in situ, lentigo maligna melanoma invades the dermis.

**Acral lentiginous melanoma** is rare in the white population but appears in higher proportions in other races (in particular in Blacks, Asians, and Pacific Islanders) [4]. It is found on acral regions, such as the palms of the hands, the soles of the feet, within nail beds, or under nail plates [2,5]. Diagnosis is often delayed due to the hidden location or because it can be mistaken for an ulcer or a plantar wart with hemorrhage.

*Table 2.1  Overview of the four major melanoma subtypes. Adapted from Clark et al [1], Smoller et al [2], Kaatsch et al [3], Bradford et al [4], and Glud et al [5].*