

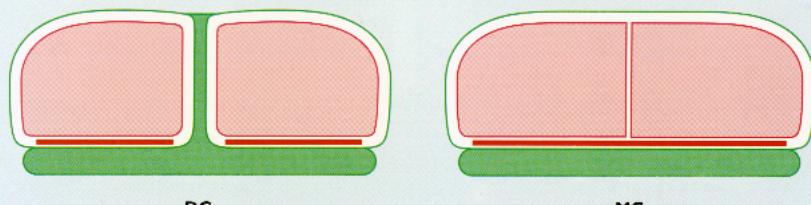
# placentation

JANE SEYMOUR with her sons, Kristopher and John Keach.



From: TWINS, Photograph by DAVID FIELDS, p. 39.

## Part I, Section 3 Understanding the pathology of twin pregnancies



**Figure 3.1** Fused DC contrasted with MC placentas: Fused DC (left) and MC (right) placentas. The septum of the DC placenta contains chorion (green), which prevents communication between the vessels (red) lying between the chorion and the amnion. In contrast, the septum of the MC placenta contains no chorion. Most MC placentas have various types of interfetal vascular anastomoses

From: AN ATLAS OF MULTIPLE PREGNANCY, Machin and Keith, p. 130.

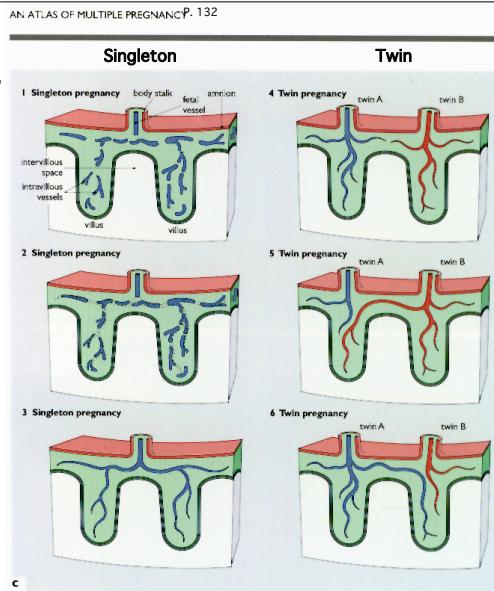
**FUSED DC PLACENTA WITH SEPTAL CHORION**



*From: An Atlas of Multiple Pregnancy, p. 130*

**Singleton and Twin  
Vascular Comparisons.**

**Uncomplicated  
singleton  
Development.**



**Every MC  
twin placenta  
has a unique  
vascularization  
pattern.**

Figure 3.3 continued

(c) Independent development of the fetal and placental circulations, which later coalesce in the area of the body stalk (1); uncomplicated coalescence as seen in a singleton pregnancy (2-3). In contrast with MC twin placentas, the patterns of connections between the two fetal circulations and the common placental circulation are so variable that every MC twin placenta in fact has a unique pattern of vascularization (4-6). The pattern probably depends on the pattern of blood flow at the time the connections were made. Varying degrees of unequal vascular sharing may occur and are further complicated by anastomotic vessels (not shown here).



**Figure 3.4** MC placentas with unequal vascular sharing:

(a) This placenta has a single a $\leftrightarrow$ a anastomosis (yellow; arrow) between twin A (to the left) and twin B (to the right; see inset). The veins of twin A (dark blue) reach well beyond the point of the a $\leftrightarrow$ a anastomosis towards twin B and drain parenchymal zones perfused by arteries of both twins. Thus, there are multiple sites of a $\rightarrow$ v anastomosis from twin B to twin A. The result in this case was growth discordance (of 26%; twins A and B weighed 2470g and 1905g, respectively) with unequal venous sharing in the presence of an a $\leftrightarrow$ a anastomosis. There was no TTT. Both cords are velamentously inserted;

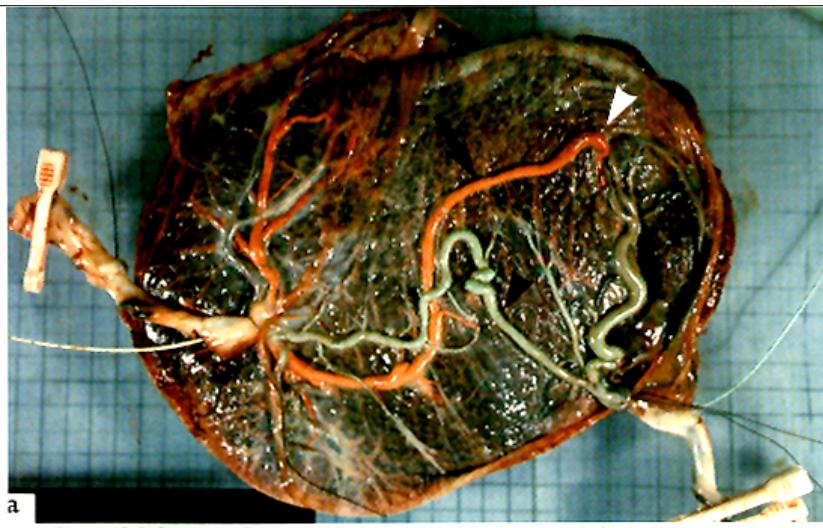
From: Menchin and Keith, *An Atlas of Multiple Pregnancy*, p. 133.



MC placentas with unequal vascular sharing:

(b) This placenta shows markedly unequal venous sharing. Twin A (to the left) weighed 1980g. Her arterial (pink) and venous (blue) zones were similar in size, and both covered a much smaller proportion of parenchyma than those of twin B (dyed yellow and green, respectively), who weighed 2560g (23% growth discordance). There is an a $\leftrightarrow$ a anastomosis (arrow), but no v $\leftrightarrow$ v or a $\rightarrow$ v anastomotic zones. Therefore, there was no development of chronic antepartum TTT. The smaller parenchymal share of twin A may be correlated with the marginal cord insertion

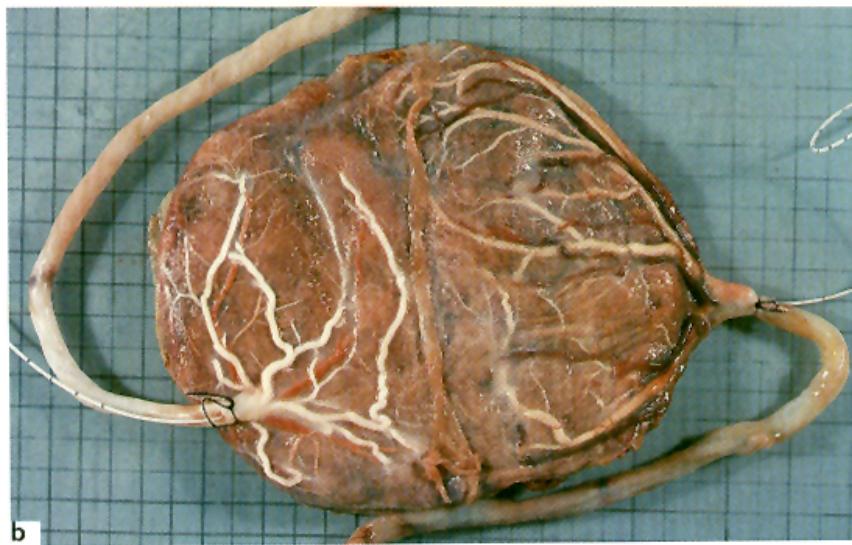
From: Machin and Keith, *An Atlas of Multiple Pregnancy*, p. 133



**Figure 3.3 Patterns of vascular anastomoses and parenchymal sharing seen in typical injection studies of MC placentas:**

(a) In this placenta, there is a large  $a \leftrightarrow a$  anastomosis (green; black arrow) and an  $a \rightarrow v$  anastomosis (white arrow) between an artery of twin B (to the right) and a vein (dyed pink) of twin A. This combination of  $a \leftrightarrow a$  with a  $a \rightarrow v$  anastomosis is the most common pattern seen in MC placentas. Note the long course taken by the vein (pink; long arrow) back to the cord of twin A (to the left), indicating unequal venous sharing.

From: Machin and Keith, *An Atlas of Multiple Pregnancy*, p. 131.



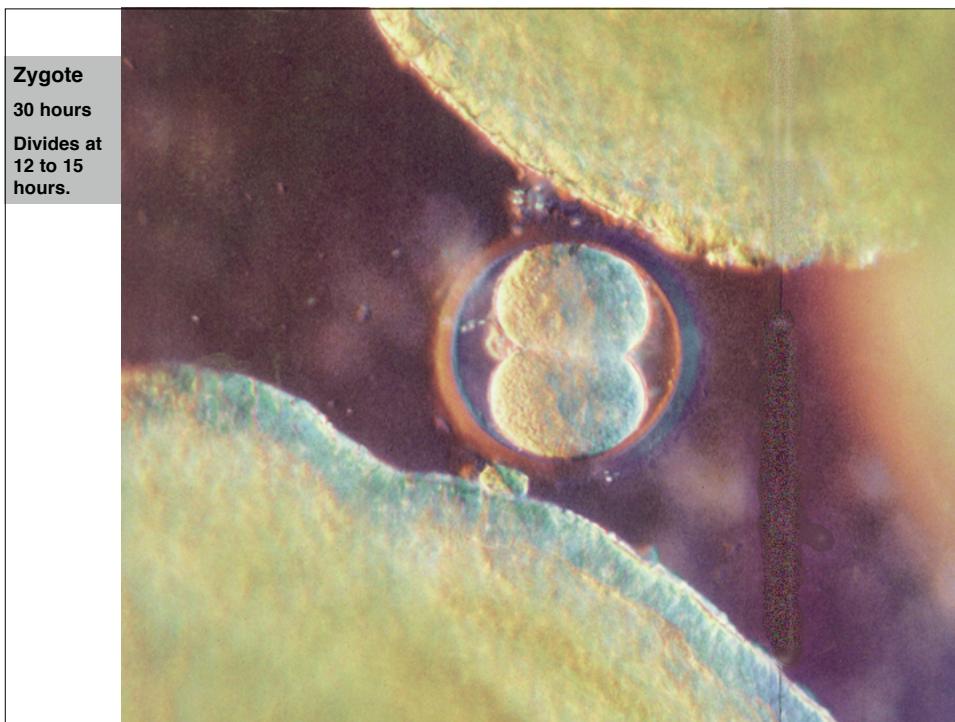
(b) Approximately 10% of MC placentas have no anastomoses. In this example, there is equal parenchymal sharing.

From: Machin and Keith, *An Atlas of Multiple Pregnancy*, p. 131

In relationship to conception,  
**When do Twins Split?**

- **Conception**

**DZ = DC, DA fused or separate placenta**  
(60% - 70% of all twins)



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- **<2 days**

**MZ = DC, DA, 2 placentas**  
(1/3 of MZ twins)

**Morula**  
2 days  
16 cells  
With  
nutrient  
cells



In relationship to conception,  
**When do Twins Spit?**

- **Conception**

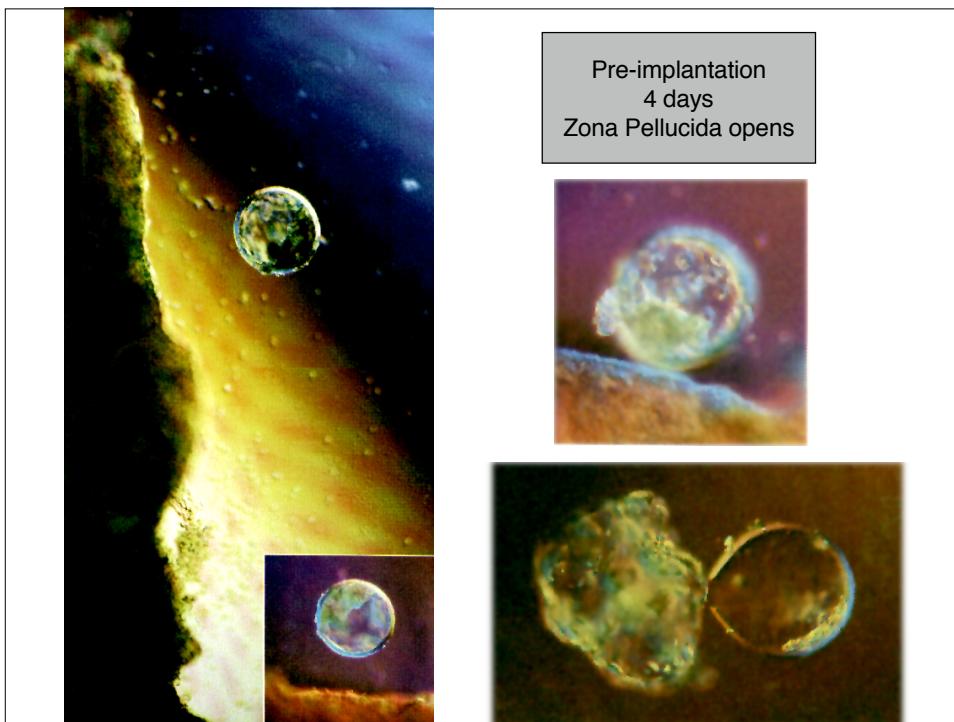
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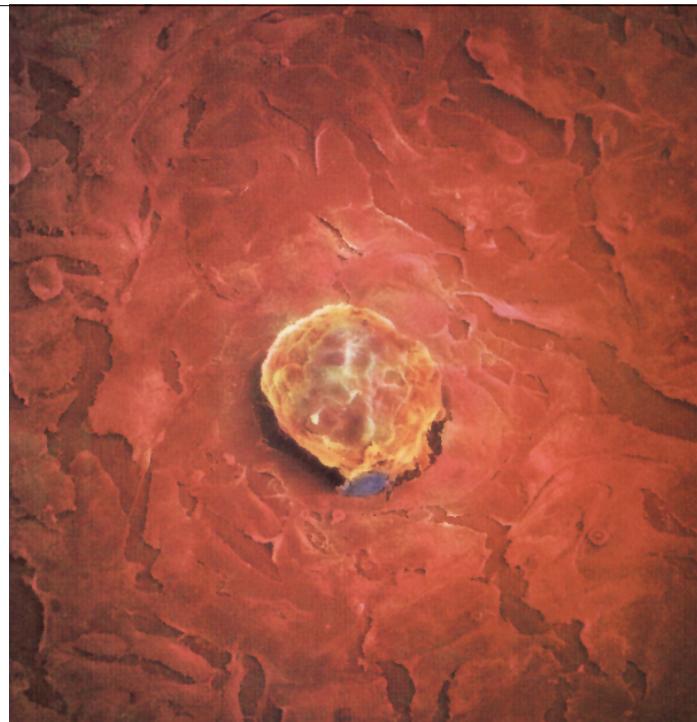
**MZ = DC, DA, 2 placentas**  
(1/3 of MZ twins)

- **2 - 8 days**

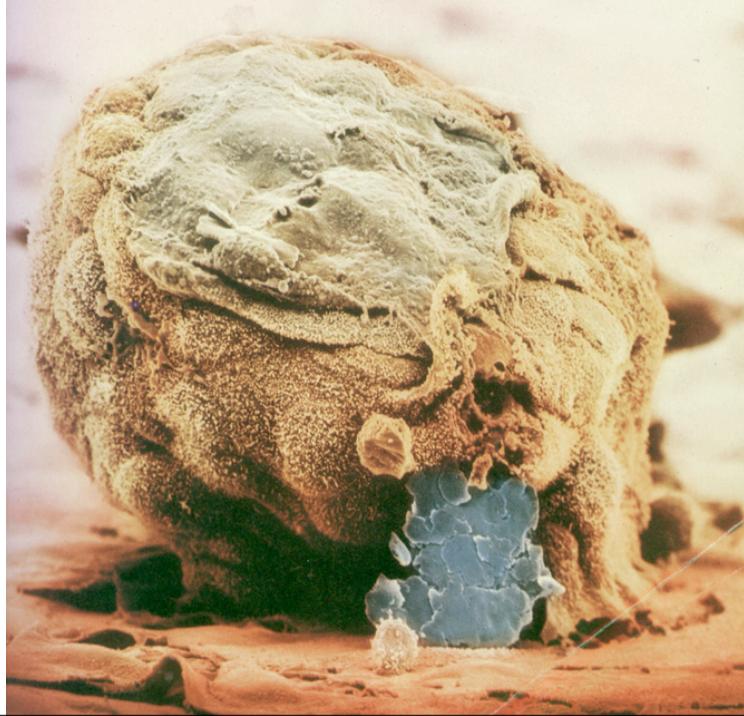
**MZ = MC, DA, 1 placenta**  
(2/3 of MZ twins have 2 yolk sacks)



**Implantation**  
Trophoblast  
8 days



**Trophoblast**  
8 days  
200 cells



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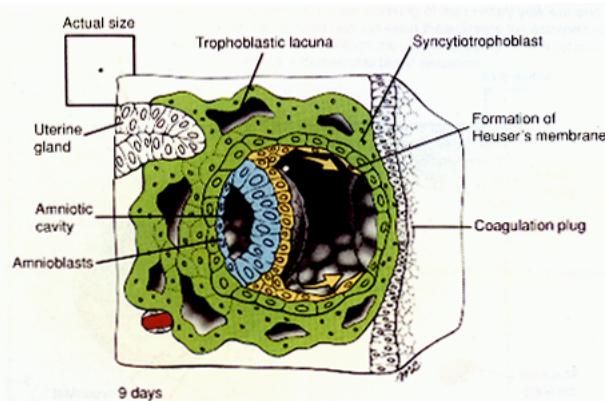
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• **2 - 8 days**

**MZ = MC, DA, 1 placenta**  
(2/3 of MZ twins have 2 yolk sacks)

• **8 - 11 days**

**MZ = MC, MA, 1 placenta**  
(5% of MZ twins have 1 yolk sack)



**Fig. 2-3.** By 9 days, the embryo is completely implanted in the uterine endometrium. The amniotic cavity is expanding, and the hypoblast has begun to proliferate and migrate out over the cytotrophoblast to form Heuser's membrane. Trophoblastic lacunae appear in the syncytiotrophoblast, which now completely surrounds the embryo. The point of implantation is marked by a transient coagulation plug in the endometrial surface.

In relationship to conception,

## When do Twins Split?

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- <2 days MZ = DC, DA, 2 placentas (1/3 of MZ twins)
- 2 - 8 days MZ = MC, DA, 1 placenta (2/3 of MZ twins have 2 yolk sacks)
- 8 - 11 days MZ = MC, MA, 1 placenta (5% of MZ twins have 1 yolk sack)
- 12 - 13 days partial split = Conjoined Twins (after the cranial caudal axis / primitive streak is laid down)
- >14 days no split, baby = a singleton

15 days - primitive streak

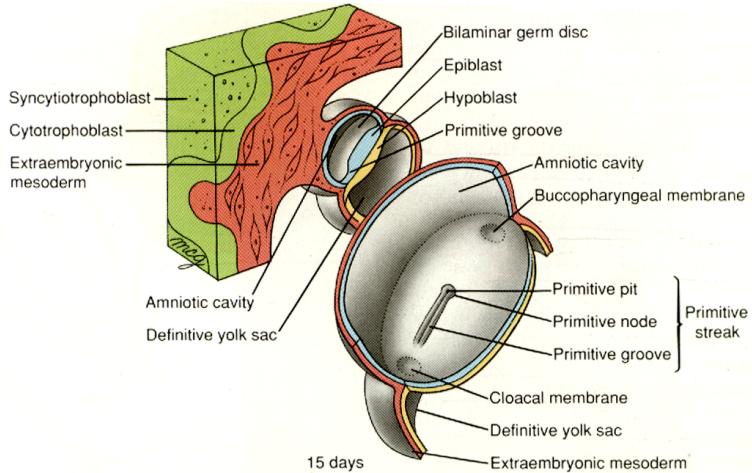
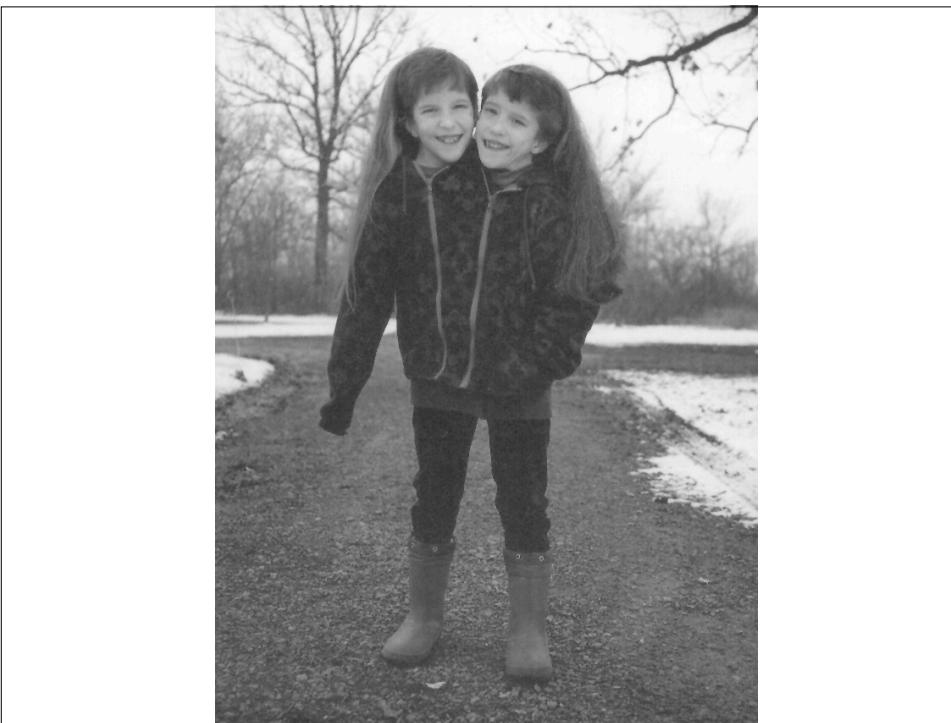
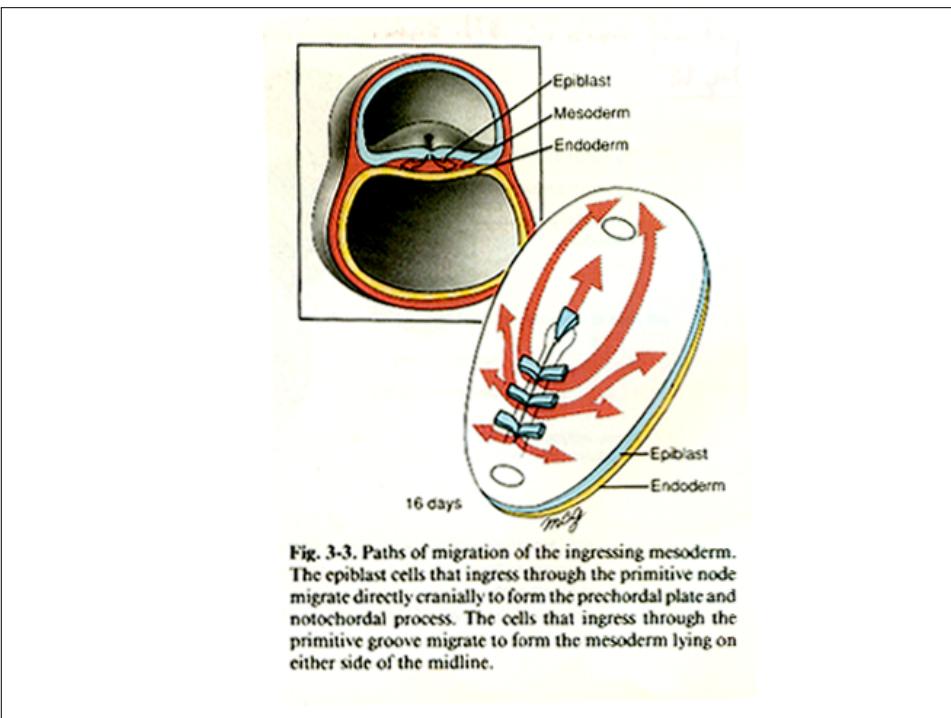
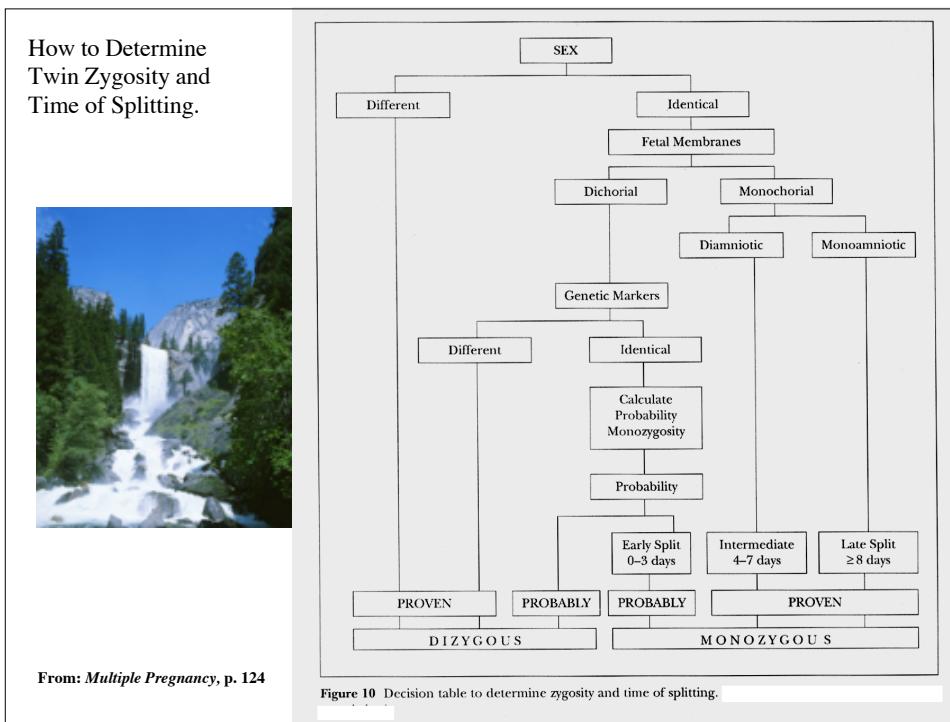
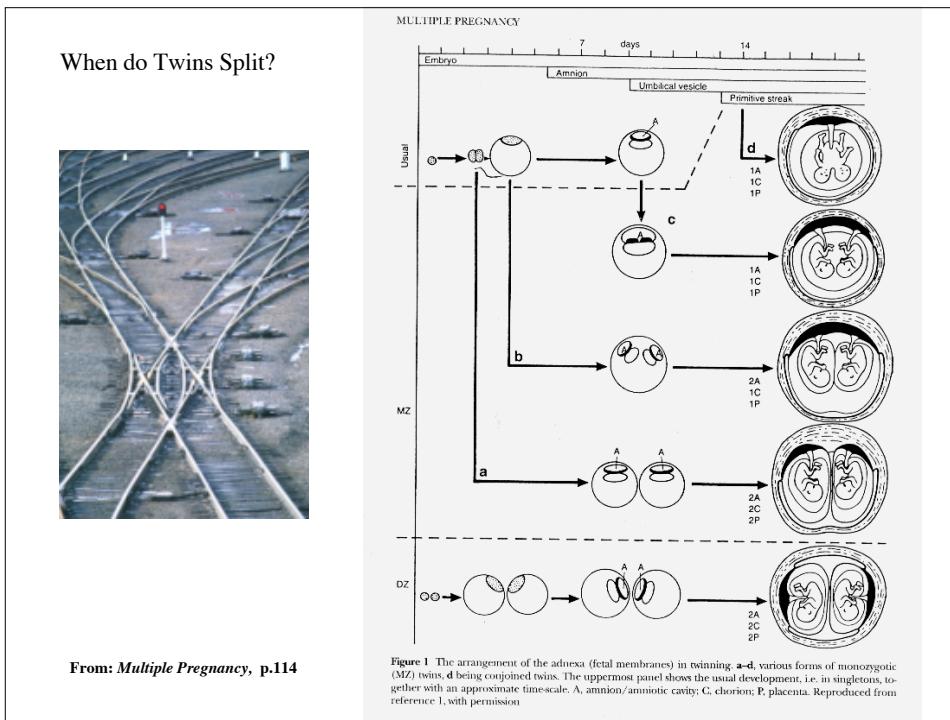
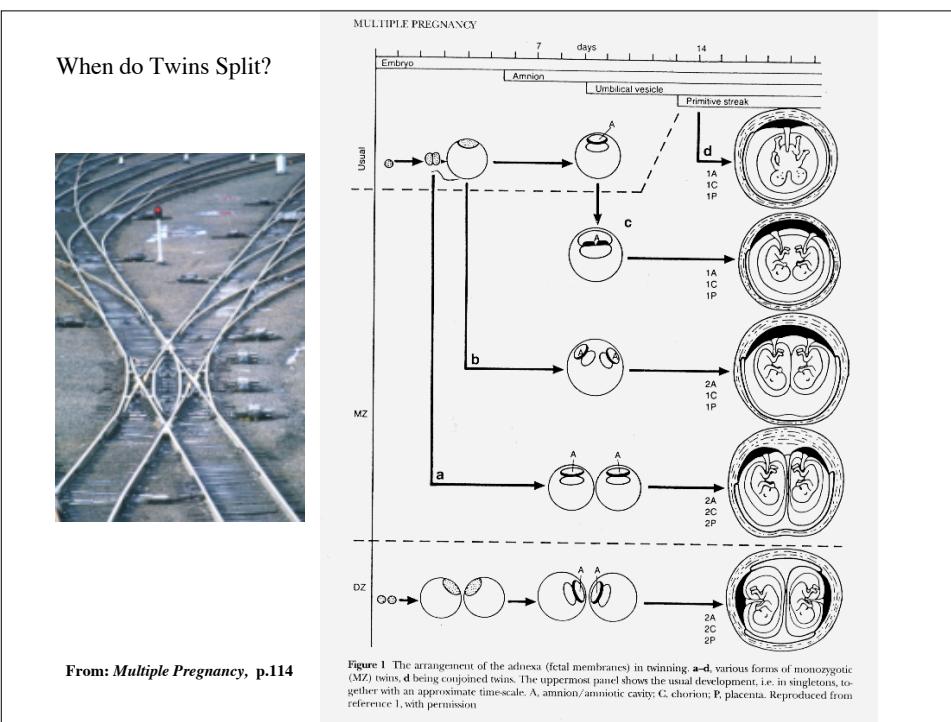
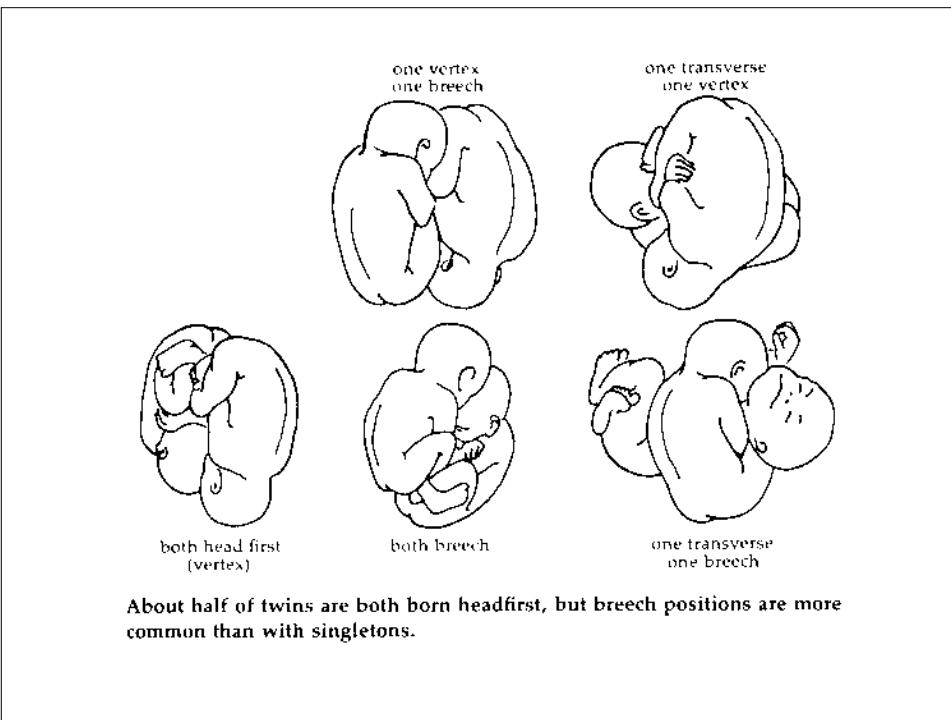


Fig. 3-1. View of the dorsal surface of the bilaminar germ disc through the sectioned amnion and yolk sac. The inset at the upper left shows the relation of the embryo to the wall of the chorionic cavity. The primitive streak, now one day old, occupies 50 percent of the length of the germ disc. The buccopharyngeal and cloacal membranes are present.

From Larson, *Human Embryology*, p. 49







In relationship to conception,

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