

Downer Cow Syndrome



Downer Cow Syndrome

- **Definition:** Any cow that remains in sternal recumbency for more than 24 hours after initial recumbency, and after treatment for primary medical problems.



Occurrence of Downer Cow Syndrome

58% of cases occur in first 24 hours of lactation

97% of cases occur in first 100 days of lactation

May become recumbent for any number of primary medical reasons: e.g. A common complication of milk fever: 20-28% of milk fever cows become “downers”

Non-medical risk factors:

Season (winter)

Management: housing, footing, trauma

Sanitation: infectious disease

Nutritional management: metabolic disease

Primary Recumbency due to Primary Disease

- **Metabolic disease:**
 - Hypocalcemia
 - Hypophosphatemia
 - Hypokalemia
 - Hypomagnesemia
 - Fatty liver disease
 - Starvation
- **Trauma**
 - During calving or when struggling to get up
 - Fractured pelvis, long bones, dislocated hip
 - Rupture of Gastrocnemius tendon
 - Nerve damage: Sciatic &/or Obturator nerve paralysis
- **Septic/Toxic shock:** eg. Mastitis, metritis, RDA/RTA, etc
- **Other:** eg. Lymphosarcoma in vertebral canal

Leads to.....

Progresses to Secondary Recumbency

- Prolonged recumbency causes pressure damage:
 - Ischemic necrosis of muscles of ‘down’ hind limb
 - edema & swelling, congestion, cellulitis, venous thrombosis
 - Primarily Gastrocnemius & Semitendinosus muscles
 - Nerve damage:
 - common Peroneal branch of Sciatic nerve.
 - Loss of function of digital extensors => knuckle over at fetlock

Leads to.....

May Progresses to Tertiary Recumbency

- Cow struggling to get up may cause musculoskeletal damage that result in long-term recumbency:
 - Fractures
 - Rupture of muscle, ligaments

Progression of Events

Primary Recumbency
(Primary disease)



Secondary Recumbency
(ischemic muscle necrosis
&/or nerve damage)

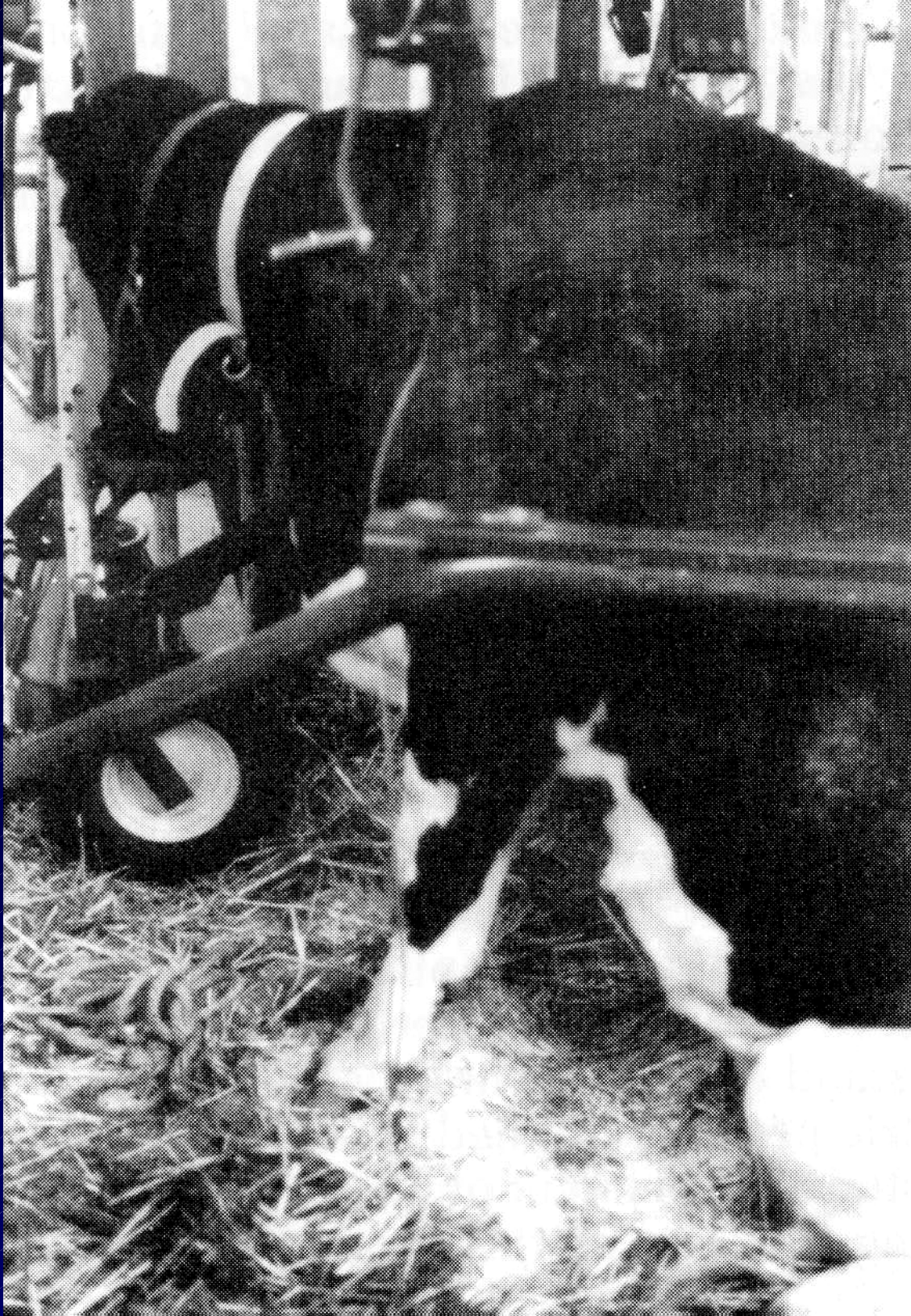


Tertiary Recumbency
(musculoskeletal injury)

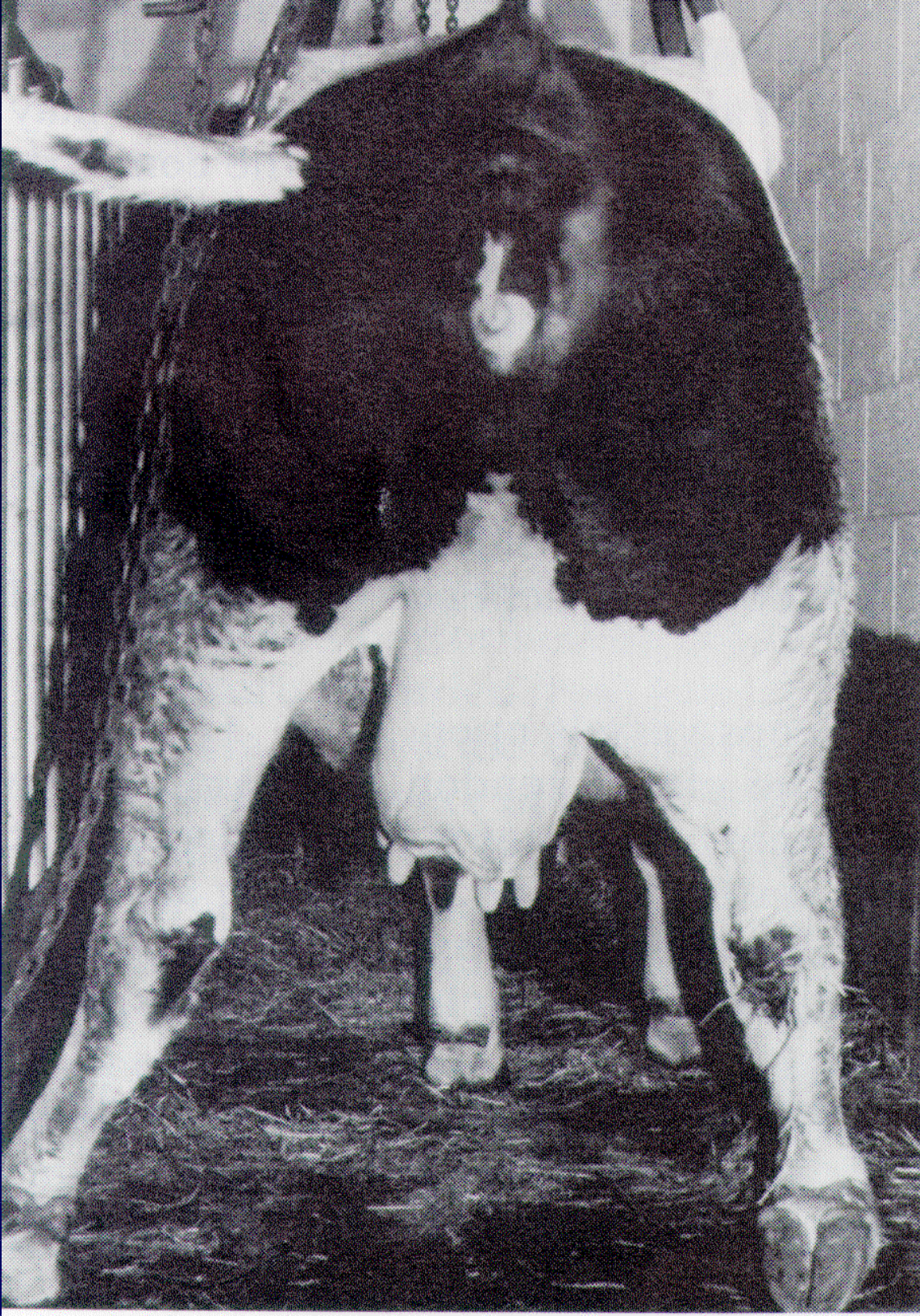
Clinical Signs

- Usually in sternal recumbency but unable to rise
- Often bright and alert (“alert downers”)
- Eating, drinking, urinating, defecating
Hindlimbs: under body or stretched out behind (“frog-legged”)
- Forelimbs functional: “creepers”
- Sensation often present in hindlimbs (withdrawal reflex)
- +/- attempts to rise (part way up “sitting” or roll to other hip)





Downer cow
'dog-sitting'



Downer cow
being lifted

What
abnormalities do
you see?





Pressure Damage and Elevated CK

- Study:
 - Used Halothane anesthesia to maintain cows in sternal recumbency for 6 - 12 hrs. (lower hind limb under body)
 - 8 of 16 animals later unable to stand => became permanent downers:
 - Initially weak leg
 - within 24 hrs => stiff, swollen leg
 - other 8 of 16 showed transient effects of pressure damage:
 - caudal ataxia and peroneal nerve paralysis

Pressure Damage and elevated CK

Time interval after induced <u>recumbency (hrs)</u>	CK values (mean +/- SD)	
	<u>Ambulatory group (8)</u>	<u>Downer group (8)</u>
0	70	60
6	110	90
12	15,140	12,430
24	36,610	39,640
48	12,800	41,640
4 days	2,160	16,160
6 days	730	5,750

Utility of CK testing

- Maximum CK activity occurs approx. 48 hrs. recumbency
- > 48 hrs., CK activity declined rapidly, even in downer animals
- a low CK value after being down for 5 days is meaningless

CK => limited usefulness as prognostic indicator

- Clinical observation a better predictor of status than CK levels.

Diagnosis

- A diagnostic challenge
- Must differentiate primary from secondary disease

Diagnosis

- History;
 - Recumbent > 24 hrs.
 - Often high producer, early lactation
 - +/- history of primary disease
 - e.g. If Hx of milk fever, ask treatment given, route of administration, serum biochemistry results, response to therapy?
 - Trauma?
 - Dystocia?
 - Infectious disease?

Diagnosis

- Physical exam:
 - Alert, but unable to rise
 - If can partly stand may observe muscle swelling, stiffness or nerve deficits
 - Thorough exam to look for other primary disease
 - TPR, rectal/vaginal exam: udder, pelvis, uterus, vagina, legs, etc., etc.

Differential Diagnoses

- Must differentiate primary from secondary causes of recumbency
- Primary diseases:
 - Blood chemistry: Milk fever, hypo-P, hypo-Mg, fat cow syndrome
 - Musculoskeletal injury (pelvis, hip, long bones, stifle, hock, ruptured tendons)
 - Nerve injury (spinal cord lesions, calving paralysis)
 - Toxic conditions: mastitis, metritis, uterine torsion, peritonitis, etc.

Clinical Pathology

- Elevated CK, AST:
 - depends on duration of recumbency
 - CK values peak after 36-48 hrs. then fall again
 - Grave prognosis is >10 times above normal and recumbent $> 2-3$ days.
- +/- hypocalcemia, hypo-Phos, hypo-Mg, hypo-K
- +/- elevated serum urea & creatinine (shock, poor renal perfusion, renal failure)

- Urinalysis:
 - Proteinuria:
 - within 48 hrs of onset of recumbency
 - due to skeletal muscle damage
 - Myoglobinuria:
 - skeletal muscle damage
 - +/- ketonuria
- Hematology:
 - Evidence of sepsis?











Treatment

- Specific treatment for any primary disease found (e.g. milk fever, hypophosphatemia)
- Analgesics/anti-inflammatories:
 - Non-steroidals?
 - Steroidals?

Treatment

- Analgesics/anti-inflammatories:
 - Non-steroidals:
 - ASA
 - Banamine (flunixin meglumine)
 - Phenylbutazone
 - Ketoprofen
 - Steroidals:
 - Dexamethasone
 - Predef

Treatment

- Analgesics/anti-inflammatories:

	Withdrawal times (AMDUCA)	
	<u>Milk</u>	<u>Meat</u>
– Non-steroidals:		
• ASA:	24 hr	1 d
• Banamine (flunixin meglumine):	72 hr	10 d
• Phenylbutazone	96 hr	12 d
• Ketoprofen	24 hr	7 d
– Steroidals:		
• Dexamethasone	0	0
• Predef	0	7 d

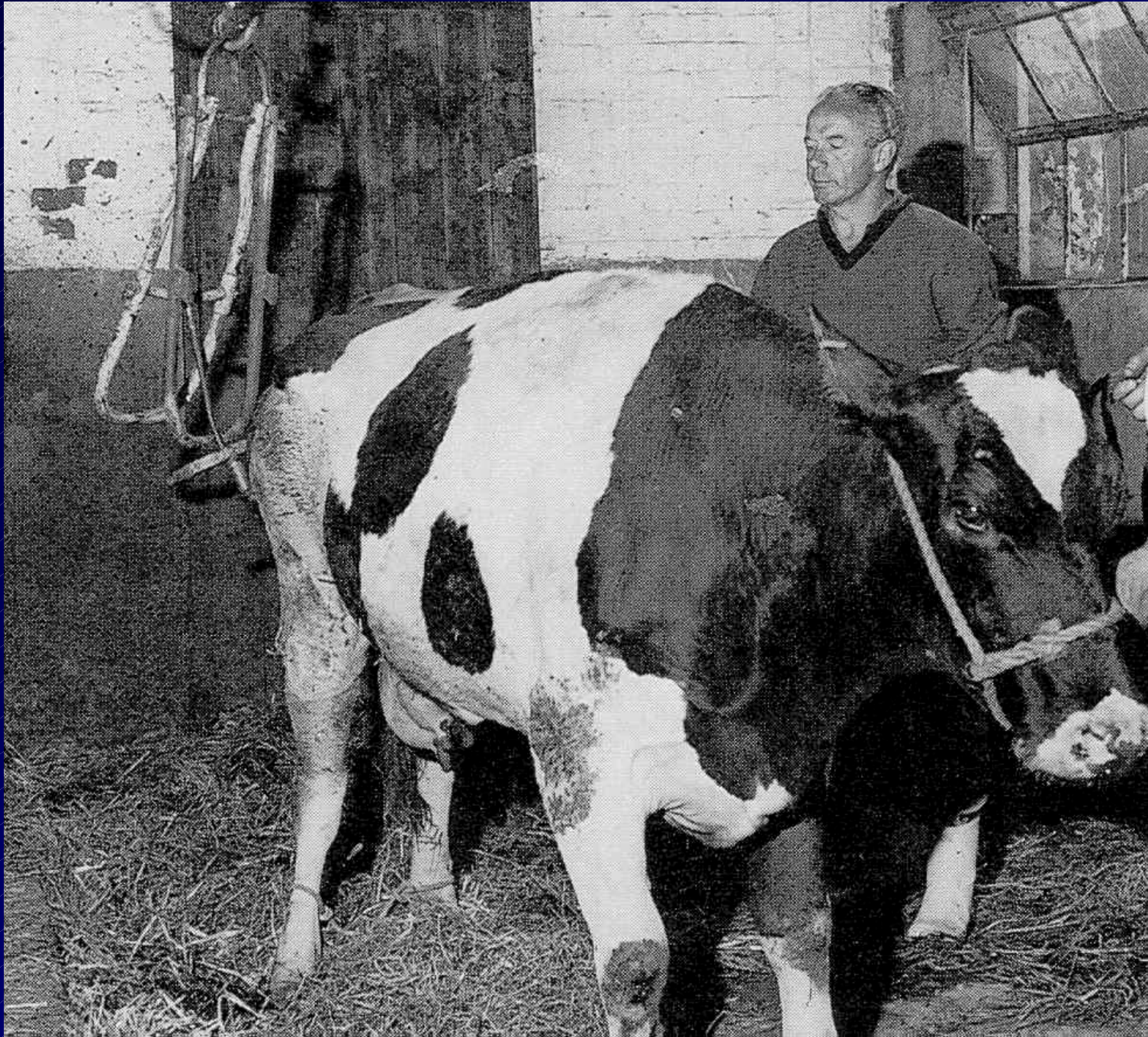
Treatment (con't)

- Supportive care:
 - good footing/traction
 - Lots of bedding/cushion
 - Shelter
 - Access to water/feed
 - Roll frequently (q 4-6 hrs.)
 - Massage hind limbs
 - Treat decubital sores & provide excellent bedding

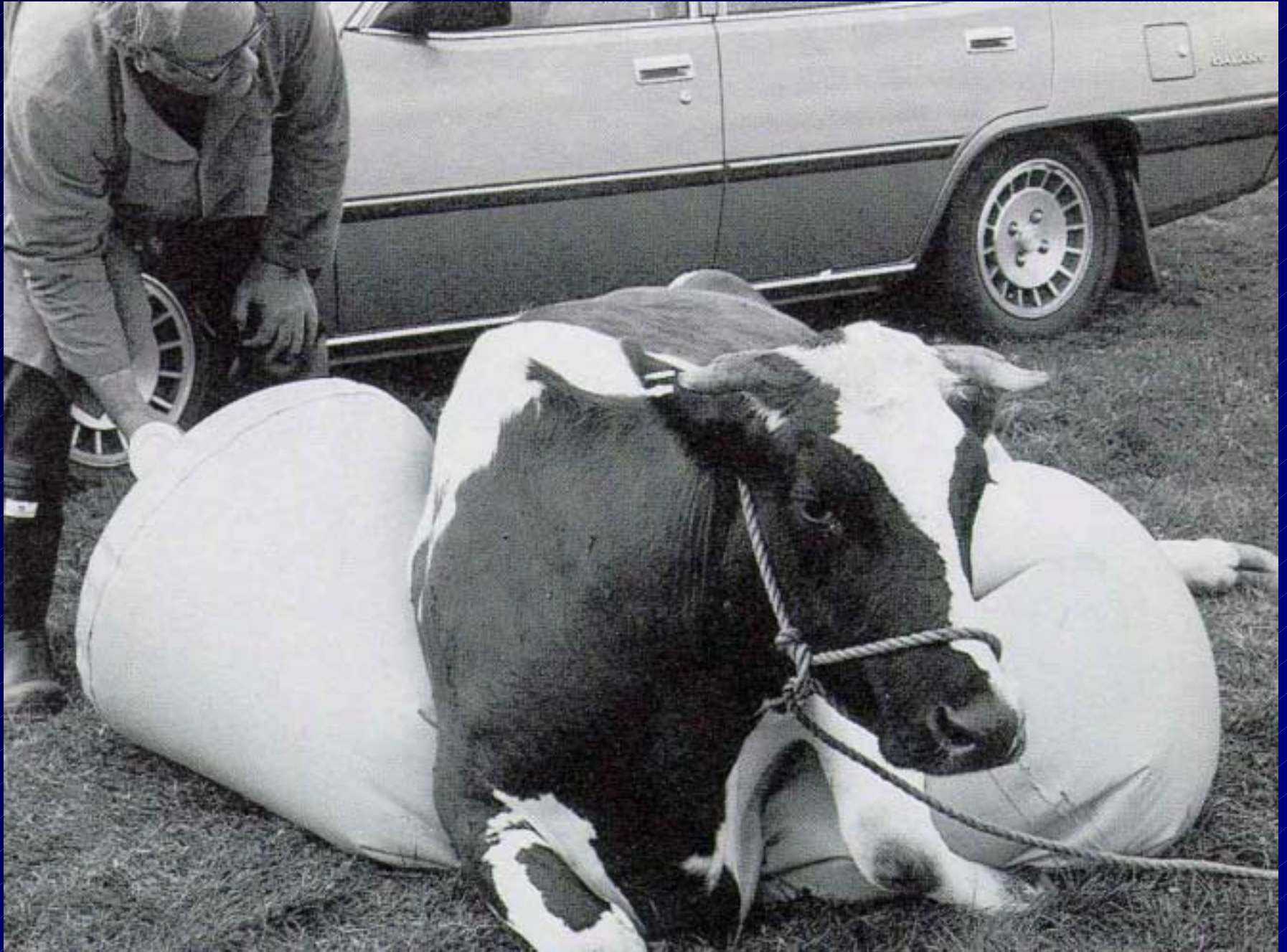
Supportive Care (con't)

- Lifting devices
 - Sling
 - Hip lifters/clamp
 - Inflatable cushions
 - Only useful if animal can stand once supported
 - Only allow short-term lifting
 - Aquatank:
 - Float in warm water for 6-8 hour periods

Hip Lifters, hobbles



Inflatable Air Bag





Flotation Tank



Prognosis

- Prognosis frequently guarded & depends on:
 - Cause of recumbency
 - Duration of recumbency
- Mortality 20-67%
- Many die within 7-10 days due to sepsis or shock
- 33 % recover between 3-30 days
- May continue treatment if no obvious physical abnormalities, bright, eating, and continued attempts to rise

Prevention

- Prevent metabolic disease:
 - excellent nutritional management
 - prompt treatment of milk fever to avoid prolonged recumbency
 - Monitor treated cows closely for 24-48 hrs. post-treatment
- Prevent trauma:
 - Non-slippery floor
 - Adequate bedding in calving area
 - Good design for chutes, etc. for moving cows
 - Move cows calmly, quietly and slowly
 - Supervise parturition & provide appropriate assistance to avoid prolonged calving.

Questions ?

