

**CERT BASIC COMMUNICATIONS**  
COMMUNITY EMERGENCY RESPONSE TEAM

Loosely based on the FEMA IS-242 Effective Communications Class

Michael A. Taylor  
coacht@gym.net



1

---

---

---

---

---

---

---

---

- Bathrooms
- Emergency exits
- Assembly area
- Fire extinguishers
- AED
- Etiquette/Respect
- Cell phones
- Food/Drinks!

**GOOD HOUSEKEEPING IS THE FIRST PRINCIPLE OF SAFETY**



2

---

---

---

---

---


---

---

---

**Communications Plans**

- Identify contacts (family, friends, vendors, etc.)
  - Names
  - Addresses
  - Phone numbers
  - Emails
  - Radio call signs
- Organize contacts into a communications plan
  - Write it down!
- Review your communications plan
  - Update frequently
- Share your plan
- Stay informed



3

---

---

---

---

---

---

---

---

**Effective Communication Skills**

Improve understanding, minimize conflict,  
and build collaboration.

**COMMUNITY EMERGENCY  
RESPONSE TEAM**

4

---

---

---

---


---

---

---

**Outline**

- Emergency Communications
- Communications Plans
- Family Radio Service (FRS)
- General Mobile Radio Service (GMRS)
- Hybrid Radios (FRS/GMRS)
- Citizen Band Radio (CBRS)
- Amateur Radio (HAM)
- FRS/GMRS Radio Frequencies
- Codes (tones)
- CERT & Radios
- Deployment example
- Documentation (Forms)



5

---

---

---

---

---

---

---

**Introductions**

- Working in pairs, introduce your partner by:
  - Name
  - Agency/Affiliation
  - Prior emergency management experience
  - What they like to do for fun



6

---

---

---

---

---

---

---

First, a Little Quiz...



7

---

---

---

---

---

---

---

---

WACKY WORDS

1 Get it Get it Get it Get it	2 Jack	3 Somewhere	4 FOOD
5 READ	6 Blood Water	7 Beeeee	8 CANCELED
9 once	10 Egg Egg HAM	11 Try Stand 2	12 T O W N
13 NI bump GHT	14 Aid ← Aid Aid	15 Million	16 Apple 3.14
17 ice <sup>3</sup>	18 G R O N I K	19 Think	20 GROUND feet feet feet feet feet feet
21 I KNOWS	22 Big Big ignores ignors	23 RAKEN	24 KNEE light light

8

---

---

---

---

---

---

---

---

Alphabet Quiz

1. What letter of the alphabet is a human organ?
2. What letter is a beverage?
3. What letter is a bird?
4. What letter is a vegetable?
5. What letter is an insect?
6. What letter marks the spot?
7. What letter is a type of shirt?
8. What letter is a large body of water?
9. What letter is a sheep?
10. What letter is a word for a line?
11. What letter is the first-person singular present of be?

9

---

---

---

---

---

---


---

---

We do more and do better as a TEAM!

*"Everyone you will ever meet knows something you don't."*

Bill Nye  
(The Science Guy)



10

---

---

---

---

---

---

---

**The biggest communication problem is we do not listen to understand. We listen to reply.**

11

---

---

---

---


---

---

---

Communication Involves

- A message
- A sender
- A receiver



12

---

---

---

---

---

---

---

**Key Functions of Emergency Information**

- Save lives and reduce injury.
- Protect property and the environment.
- Facilitate the tactical response (e.g., SIP).
- Educate, inform, and change behavior and attitudes (e.g., pandemic).
- Seek the public's cooperation (e.g., evacuation).
- Instill public confidence.
- Provide information to help families reunite.

13

---

---

---

---

---

---

---

**Creating Effective Emergency Communications**

Successful emergency communications should:

- Present the information in sequence.
- Be worded precisely.
- Avoid jargon, code, and acronyms.
- Use common terminology.
- Omit unnecessary details.
- Speak in sync with other related authorities.
- Keep messages consistent across various media.

14

---

---

---

---

---

---

---

**Basic CERT Communications**

- Damage Assessments (windshield surveys)
- Resources available / needed
- Interface with Incident Management / EOC
- Interface with Sponsoring Agency

15

---

---

---

---

---

---

---

### FRS - Family Radio Service

- The Family Radio Service (FRS) is an unlicensed [walkie talkie](#) radio system
  - FRS radios are compact, handheld, wireless 2-way radios
  - The FRS is authorized on 22 channels in the 462 MHz and 467 MHz range, all of which are shared with General Mobile Radio Service (GMRS) which requires an individual license for use.
  - Channels 15-22 are GMRS only (ok to listen)
  - FRS is a *license free* radio service (NO LICENSE REQUIRED)



Garmin ICOM Midland Cobra Uniden Motorola

16

---

---

---

---

---

---

---

---

### FRS - Key Features

- Uses “channelized” frequencies in the [ultra high frequency](#) (UHF) band. Operate on any of 22 dedicated channels (1-22)
- Is quiet and clear because it uses [frequency modulation](#) (FM) instead of [amplitude modulation](#) (AM).
- Has limited range (~0.5 mi) because
  - They have a maximum allowable power of 1/2 watt, and
  - They have a fixed small (poor) antenna

**Note:** FRS Radio transceivers and their antennas may not be modified to extend their range.

17

---

---

---

---

---

---

---

---

### FRS - Radio Distinctions

- Unlike with GMRS and Ham radios, there is no license required to use an FRS radio
- There are no fees for usage, airtime or per-call charges
- Aside from the cost of batteries, they are virtually free to use
- Usually VERY inexpensive

18

---

---

---

---

---


---

---

---

### FRS Summary

- License
  - None
- Pros
  - Simple Operation
  - Inexpensive
  - Plentiful
  - No license required
  - Shares frequencies with GMRS
- Cons
  - Poor range in urban areas
  - Interference from other FRS/GMRS users
  - Not usually rugged or waterproof
- Uses
  - Intra-Field Team Communications
  - Staging Area Communications



19

---

---

---

---

---


---

---

---

### GMRS - General Mobile Radio Service

- The General Mobile Radio Service (GMRS) is a licensed walkie talkie or base station radio system
- GMRS radios are typically handheld portable devices much like FRS radios, and share some frequencies with FRS
- Same 22 channels as FRS (1 to 15 shared, 16 to 22 are GMRS only)
- GMRS radios provide very good clarity over a slightly longer range (~0.5 up to 2.0 miles) than FRS
- GMRS is an FCC licensed radio service (\$35/10 years)



Note: A Ham radio license does not cover GMRS frequencies

20

---

---

---

---

---

---

---

---

### GMRS - Key Features

- Uses “channelized” frequencies in the ultra high frequency (UHF) band. Operate on any of 22 dedicated channels
- Is quiet and clear because it uses frequency modulation (FM) instead of amplitude modulation (AM).
- Has slightly longer range (~1-2 mi) because
  - Handy Talkies have a typical power of 1-5W, but
  - Still have a small antenna (sometimes removable)

Note: GMRS Base stations can have power up to 50W (on channels 15-22) and may use an external, gain antenna.

21

---

---

---

---

---

---

---

---

### GMRS – Rules and Guidelines

- Is intended for use by an individual who possesses a valid GMRS license, as well as his or her immediate family members.
- FCC definition of immediate family includes a spouse, children, parents, grandparents, aunts, uncles, nephews, nieces, and in-laws
- Immediate relatives of the GMRS system licensee are entitled to communicate among themselves for personal or business purposes
- Employees or friends of the licensee, who are not family members, may not use this service
- There is no longer a GMRS license available for clubs or groups.

22

---

---

---

---

---

---

---

---

### GMRS Summary

- **License**
  - \$35 for 10-year FCC license
- **Pros**
  - Simple Operation
  - Inexpensive
  - Plentiful
  - Shares frequencies with GMRS
  - Pro-grade radios available
  - License requires no test
- **Cons**
  - Limited range in urban areas
  - Interference from other FRS/GMRS users
- **Uses**
  - Command/Field Team Communications
  - Intra-Field Team Communications
  - Staging Area/Logistics Communications



23

---

---

---

---

---

---

---

---

### Dual-Service or Hybrid Radios FRS / GMRS

- These common radios provide access to both the FRS and GMRS bands
  - FRS channels (1-14) and
  - GMRS channels (1-7 & 15-22).
  - GMRS channels requires an FCC operator's license
- These radios may be used without a license, if ...
  - the "FRS only" channels (8-14) are used, or
  - channels 1-7 are used on low power (<0.5 w)

24

---

---

---

---

---

---

---

---



### Citizens Band (CBRS)

- The Citizens Band Radio Service (CBRS) is a private, two-way, short-distance voice communications service for personal or business activities of the general public. It also may be used for voice paging.
- Authorized for 40 channels between 26.965 MHz and 27.405 MHz.
- Range of about 3 miles to 20 miles
- Anyone, regardless of age, can operate a CB station – except a foreign government, a representative of a foreign government, a federal government agency or someone who has received an FCC a cease-and-desist order that is still in effect. Anyone who is eligible may operate a CB station for personal or business use, in accordance with the rules.
- An individual license is not required to operate a CB station in the U.S.
- FCC does not renew formerly issued CB Radio Service licenses

25

---

---

---

---

---

---

---

---

### Radio Amateur - HAM

- The Amateur Radio Service (HAM) is an FCC licensed radio service for many radio bands and many radio types
  - CERT teams often use HAM radios that are handheld portable devices call handy talkies (HT's) on the 2M (VHF) or 440 (UHF) bands
  - HT radios on these bands provide very good clarity over a much longer range than GMRS
  - HAM radio is a licensed radio service that requires passing a test



26

---

---

---

---

---

---

---

---

### HAM Summary (Amateur Radio Service)

- **License**
  - \$35/Exam for 10-year FCC license
- **Pros**
  - Quality construction
  - Compatible with City systems
  - Many frequencies & longer range
  - Powerful mobile & base station units available
- **Cons**
  - Complicated operation
  - Exam required
  - Expensive
- **Uses**
  - Command / EOC / FMZ (fire management zone)
  - Command / Field Team
  - Health & Welfare



27

---

---

---

---





---

---

---

---

### Comparison

FRS	GMRS	CBRS	Ham
			
~0.5 mi range* \$15-\$80 AA or AAA No License	~1-2 mi range* \$30-\$200 AA or NiMH FCC License (no test)	~3-20 mi range* \$150-\$500 110 or 12v No License	~5 mi range** \$100-\$400 AA or NiMH FCC test & License
* typical range in a city		**much farther using repeaters	

28

---

---

---

---

---

---

---

---

### FRS/GMRS Shared Frequencies (Ch 1-7, GMRS 5w max power)

Name	Frequency (MHz)	Motorola convention	Icom F21-GM convention
"FRS 1" or "5625"	462.5625	** Ch. 1 **	Ch. 9
"FRS 2" or "5875"	462.5875	Ch. 2	Ch. 10
"FRS 3" or "6125"	462.6125	Ch. 3	Ch. 11
"FRS 4" or "6375"	462.6375	Ch. 4	Ch. 12
"FRS 5" or "6625"	462.6625	Ch. 5	Ch. 13
"FRS 6" or "6875"	462.6875	Ch. 6	Ch. 14
"FRS 7" or "7125"	462.7125	Ch. 7	Ch. 15

\*\* National Call/Distress Channel by REACT & National SOS Radio Network

29

---

---

---

---

---

---

---

---

### FRS Only Frequencies (Ch 8-14\*, 0.5w max)

Channel	Frequency	Notes
FRS 8	467.5625	FRS use only
FRS 9	467.5875	FRS use only
FRS 10	467.6125	FRS use only
FRS 11	467.6375	FRS use only National Drill Channel
FRS 12	467.6625	FRS use only
FRS 13	467.6875	FRS use only
FRS 14	467.7125	FRS use only

\* Great channels for CERT, no license needed on any radio

30

---

---

---

---

---

---

---

---

**GMRS Only Frequencies  
(Ch 15-22, GMRS up to 50w)**

Name	Simplex frequency (MHz) Repeater output	Repeater input (MHz)	Motorola convention	Icom F21-GM convention
"550"	462.550	467.550	Ch. 15	Ch. 1
"575"	462.575	467.575	Ch. 16	Ch. 2
"600"	462.600	467.600	Ch. 17	Ch. 3
"625"	462.625	467.625	Ch. 18	Ch. 4
"650"	462.650	467.650	Ch. 19	Ch. 5
"675"	462.675	467.675	Ch. 20	Ch. 6
"700"	462.700	467.700	Ch. 21	Ch. 7
"725"	462.725	467.725	Ch. 22	Ch. 8

31

---

---

---

---

---

---

---

---

**Codes (Tones) 1 of 4**

Tone	Cobra 250/300	Cherokee 465	Midland 75-510	Motorola Sport	Motorola TalkAbout	Radio Shack
67.0	1	1	1		1	1
69.3		2				
69.4						2
71.9	2	3	2		2	3
74.4	3	4	3		3	4
77.0	4	5	4	A	4	5
79.7	5	6	5		5	6
82.5	6	7	6		6	7
85.4	7	8	7		7	8
88.5	8	9	8	B	8	9
91.5	9	10	9		9	10
94.8	10	11	10		10	11
97.4	11	12	11	C	11	12

32

---

---

---

---

---

---

---

---

**Codes (Tones) 2 of 4**

Tone	Cobra	Cherokee	Midland	Motorola Sport	Motorola TalkAbout	Radio Shack
100.0	12	13	12		12	13
103.5	13	14	13		13	14
107.2	14	15	14	D	14	15
110.9	15	16	15		15	16
114.8	16	17	16		16	17
118.8	17	18	17	E	17	18
123.0	18	19	18		18	19
127.3	19	20	19	F	19	20
131.8	20	21	20		20	21
136.5	21	22	21	G	21	22
141.3	22	23	22		22	23
146.2	23	24	23		23	24
151.4	24	25	24		24	25

33

---

---

---

---

---

---

---

---

### Codes (Tones) 3 of 4

Tone	Cobra	Cherokee	Midland	Motorola Sport	Motorola TalkAbout	Radio Shack
156.7	25	26	25		25	26
159.8		27				27
162.2	26	28	26		26	28
165.5						29
167.9	27	29	27		27	30
171.3						31
173.8	28	30	28		28	32
177.3						33
179.9	29	31	29		29	34
183.5		32				35
186.2	30	33	30		30	36
189.9		34				37
192.8	31	35	31		31	38

34

---

---

---

---

---

---

---

---

---

---

### Codes (Tones) 4 of 4

Tone	Cobra	Cherokee	Midland	Motorola Sport	Motorola TalkAbout	Radio Shack
196.6		36				
199.5		37				
203.5	32	38	32		32	
206.5		39				
210.7	33	40	33		33	
218.1	34	41	34		34	
225.7	35	42	35		35	
229.1		43				
233.6	36	44	36		36	
241.8	37	45	37		37	
250.3	38	46	38		38	
254.1		47				

35

---

---

---

---

---

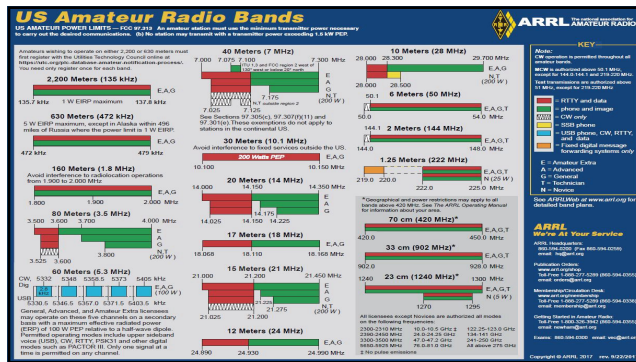
---

---

---

---

---



36

---

---

---

---

---

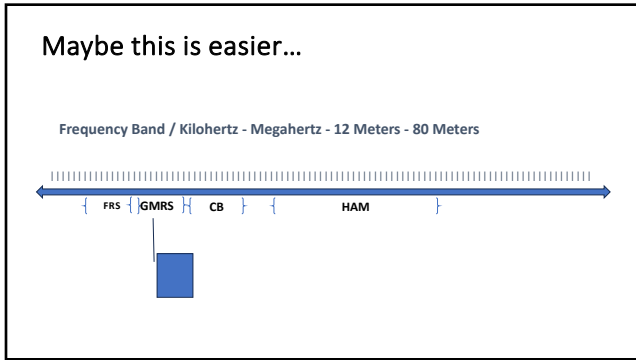
---

---

---

---

---



37

---

---

---

---

---

---

---

---

**Federal Communications Commission**

- Yes, they monitor all frequencies
- Yes, they will find you
- They can fine you (\$500/day), confiscate your equipment, and/or imprison you (up to 1 year) for:
  - Using FRS or GMRS with more watts than allowed,
  - Not using your call sign (identifying yourself) with HAM or GMRS,
  - If “misbehaving” (swearing) or abusing the system (selling).

38

---

---

---

---

---

---

---

---

**CERT & Radios**

- FRS are great radios for CERT teams
  - Radio communication within the team
  - Radio communications with CERT local command
  - Follow simple “FRS Radio Basics”
- BUT - most “blister pack” radios sold today are dual purpose (FRS/GMRS) and CERT trailers and teams will most likely have this type, so...
  - Assign & Practice with FRS only channels (8-14)

**Do not use the GMRS frequencies unless all (or key) team members have a GMRS license!**

39

---

---

---

---

---

---

---

---

### Ham & FRS/GMRS/CBRS

**Ham radios**

- Are excellent for communications from CERT team “monitors” to the local, city or county EOC’s (Emergency Operation Center)
- Can monitor all FRS/GMRS frequencies
  - Can be set to scan all frequencies
  - Excellent for monitoring multiple teams

**But cannot be used to communicate to the teams on FRS or GMRS frequencies**

40

---

---

---

---

---

---

---

---

### Deployment Example

**H=Ham**  
**G=GMRS**  
**F=FRS**

**FRS & CB radios are used for local CERT team communications**  
**GMRS radios are used for CERT coordinator communications**  
**HAM radios are used for EOC Communications**

41

---

---

---

---

---

---

---

---

### Effective Radio Communications

- Stand in a safe place (not the middle of a road!)
- Hold 25 radio with antenna VERTICAL
- Hold radio about 2” from your mouth
- Know what you are going to say before going on the air
- Be brief – 25 words in 5-word groups, pausing after each group
- Remember someone is writing down what you say
- Hold the PTT (Push to Talk) button, wait two seconds, then speak slowly, clearly, and concisely
- Be polite and remember FRS radio is NOT secure and many people can be listening

42

---

---

---

---

---

---

---

---

### Effective Radio Communications

- Team Leader and Incident Command determine channel
- Test radio before going out
- Bring extra batteries
- Prioritize! Only Who, What, When, Where, and How
- Get permission to speak
- Remember to release the PTT button when done speaking
- No "10 codes" or jargon, no slang, no jokes
- Repeat back messages received
- Use common radio language
- Use Phonetic alphabet (Alpha, Bravo, Charlie, etc.)
- Say numbers as single digits (Three Zero One Nine, etc.)

43

---

---

---

---

---

---

---

---

### Common Terminology

Radio Check	Can you hear me? What is my radio strength?
Come In	Asking for the other party to acknowledge they hear you
Go Ahead	You are ready to receive transmission
Copy	You understand what was said
Over	Your message is complete

44

---

---

---

---

---

---

---

---

### Common Terminology

Out	All conversation is finished – channel is clear
Stand By	Acknowledging the other party, unable to respond now
Roger	Message received and Understood
Affirmative	Same as YES (avoid 'yep' as it is difficult to hear)
Negative	Same as NO (avoid 'nope' as it is difficult to hear)

45

---

---

---

---

---

---

---

---

Common Terminology	
Say Again	Re-transmit your message
Break, Break, Break	Interrupting a communication with an EMERGENCY
Read you loud & clear	Response to 'Radio Check' – signal is good (may say 5 by 5)
Repeat	Used when sender repeats their message
Wilco	I will comply as directed

46

---

---

---

---

---

---

---

**CERT Radio Communications Sample**

T1: Control, this is Team 1, request radio check. Over.

Control: Team 1, this is Control, radio check loud and clear. Over.

T1: Control, this is Team 1, major incident observed, I have a building damage report when you are ready. Over.

Control: Team 1 stand by. Over.  
(few seconds pass)

Control: Team 1 from Control, ready for your building damage report. Over.

T1: Control, this is Team 1, major incident discovered at two four seven zero Pulgas Avenue. Warehouse fire with hazards of falling debris and potential building collapse. Copy? Over.

Control: Team 1, this is Control, copy warehouse fire and potential building collapse at two four seven zero Pulgas Avenue. Over.

T1: Control, this is Team 1, conducting perimeter search, Providing medical services to three individuals who evacuated the building. Request police, fire, and ambulance if available. Copy? Over.

Control: Team 1, this is Control, request received, I read back (and would be repeated back to confirm), all correct? Over.

T1: Control, this is Team 1, all correct. Over.

Control: Team, 1, this is Control, further resources enroute, continue as per major incident protocols, we will contact you again in five minutes. Out

47

---

---

---

---

---

---

---

Phonetic Alphabet			
A Alpha	G Golf	N November	T Tango
B Bravo	H Hotel	O Oscar	U Uniform
C Charlie	I India	P Papa	V Victor
D Delta	J Juliet	Q Quebec	W Whiskey
E Echo	K Kilo	R Romeo	X X-Ray
F Foxtrot	L Lima	S Sierra	Y Yankee
	M Mike		Z Zulu

48

---

---

---

---

---

---

---





49

---

---

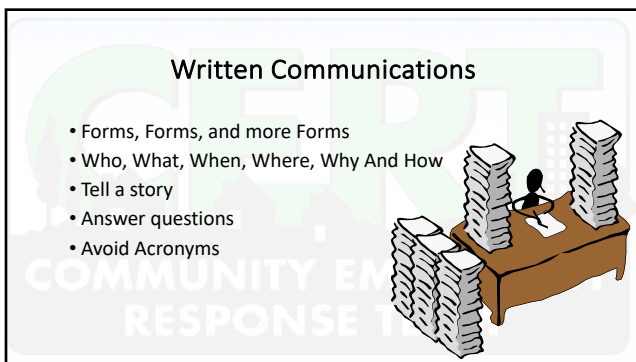
---

---

---

---

---



50

---

---

---

---

---

---

---



51

---

---

---

---

---

---

---







<b>EMERGENCY ASSIGNMENT</b>		DATE	TIME
CONTINGENCY CONTACT #		TIME LEFT	TIME BACK
<b>INSTRUCTIONS TO TEAM</b>			
TO WHOM			
LOCATION			
AS ASSIGNED			
ASSIGNMENT EVALUATION			
<b>REPORT FROM RESPONSE TEAM</b>			
AREA	ISSUES	PROBLEMS	REMARKS
PERSONNEL	TECHNICAL	EQUIPMENT	OTHER
OPERATIONS	SAFETY	TRAINING	
COMMUNICATIONS	LOGISTICS	PLANNING	
INTELLIGENCE	OPERATIONAL	MANAGEMENT	
LEGAL	FINANCIAL	ADMINISTRATIVE	
OTHER			

CERT FORM #14

61

---

---

---

---

---

---

---

---

**CERT**  
Victim Data Form

NAME		AGE	SEX	HAIR	EYES
ADDRESS		CITY			
STATE		ZIP			
PHONE		FAX			
RELATIONSHIP TO VICTIM		OCCUPATION			
EDUCATION		MARITAL STATUS			
RELIGION		ETHNICITY			
RACE		HEIGHT			
WEIGHT		HAIR COLOR			
EYES COLOR		SKIN COLOR			
BUILD		SCARS/SCALDS			
TATTOOS		DENTAL RECORD			
GLASSES		SPECIAL NEEDS			
OTHER		REMARKS			

PHOTO

- Head
- Neck
- Face
- Shoulders
- Arms
- Hands
- Wrists
- Elbows
- Forearms
- Wrists
- Hands
- Feet
- Ankles
- Legs
- Feet

CERT FORM #15

62

---

---

---

---

---

---

---

---

<b>VICTIM TREATMENT AREA RECORD</b>			CERT	DATE	
TREATMENT AREA LOCATION					
TIME IN	NAME OR DESCRIPTION	TRAGE TIME (DPOH)	CONDITION/TREATMENT (REFER TO ICD-9)	MOVED TO	TIME OUT
1		MINOR DELAY		1	1
		MINOR DELAY			
		MINOR DELAY			
		MINOR DELAY			
SCRIBES:				PAGE ___ OF ___	

CERT FORM #5

63

---

---

---

---

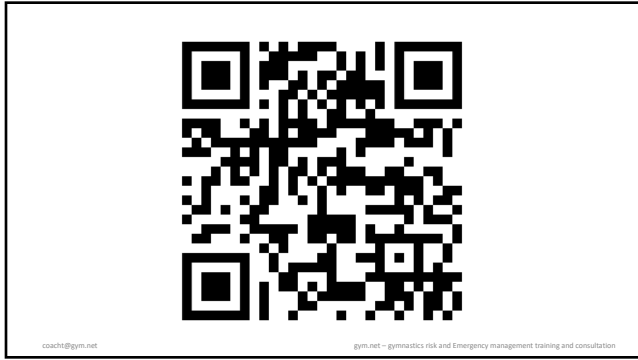
---

---

---

---





---

---

---

---

---

---

---