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Norovirus infection in health and social care settings

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Hosted by Martin Kiernan
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Objectives

- Recognise the clinical presentation of norovirus
- Describe the mechanisms of transmission for norovirus infections
- Discuss the impact of norovirus outbreaks on the individual and the organisation, using local experiences in acute healthcare as examples
- Discuss interventions designed to control norovirus transmission

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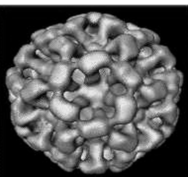
Aetiology

- Small Round Structure Virus (SRSV)
- Single stranded, non-enveloped RNA virus belonging Caliciviridae family
- AKA Norwalk, Norwalk-like virus



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Clinical features

- **Incubation 24 – 48 hours**
- **Affects all age groups**
- **Onset gradual or abrupt**
- **Nausea**
- **Abdominal cramps**
- **Myalgias, malaise and headaches**
- **Low grade fever (about 50%)**
- **Vomiting (often projectile) and diarrhoea**

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Route of transmission

- Person – person
  - Faecal-oral
  - air-oral/mucous membrane
- Environment to person
- Foodborne

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Why are SRSVs such good pathogens?

- Effectively dispersed - airborne
- Relatively resistant in the environment
- Low infectious dose (10 – 100 vps)
- High attack rate - 50%
- Short lived immunity
- Continued shedding for weeks after resolution of symptoms

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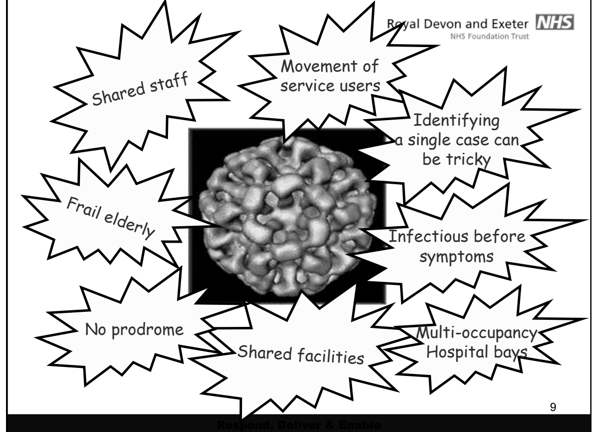
Principles of outbreak prevention and management

- Single cases
  - Early identification
  - Isolation/segregation of suspected case from others
  - Restrict movement of exposed patients until incubation period passed
  - Environmental decontamination
  - Communication to other care providers if transfer required
- Outbreak
  - Avoid admissions to and transfers from the outbreak area

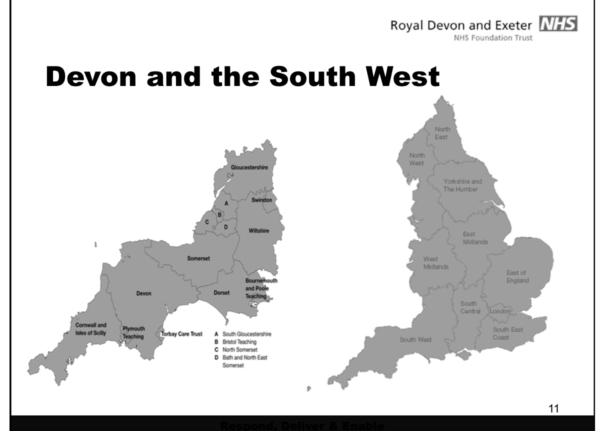
Why do SRSVs spread so easily in communal care settings?



Additional challenges in social care settings

- IPC expertise often not as readily available as in a hospital
- It is a home, not a hospital, and the environment reflects this
  - Soft furnishings
  - Difficulty cleaning
- Days rooms, dining rooms and activity areas
  - Exposure of large numbers of residents if index case symptomatic in communal area

Devon and the South West



Laboratory reports in England and Wales, by HPA region 2000-2012

Year	Region									
	East of England	East Midlands	London	North East	North West	South East	South West	West Midlands	Yorkshire and Humberside	Wales
2000	151	47	17	51	257	243	487	174	409	86
2001	193	51	74	100	215	128	481	42	379	82
2002	308	111	186	159	393	392	1020	396	1062	281
2003	210	93	46	21	139	160	1111	164	268	115
2004	439	239	81	79	107	178	1299	209	305	197
2005	599	213	55	38	62	233	1040	145	306	231
2006	690	189	42	213	83	323	1438	750	436	447
2007	695	266	175	435	242	528	1963	799	499	407
2008	758	233	186	542	218	534	1801	888	1610	58
2009	832	211	60	624	330	357	2157	1025	2057	62
2010	1340	449	235	481	651	525	4124	1596	1910	469
2011	924	510	480	279	549	239	2749	691	1914	213
2012*	1227	481	1254	350	887	309	2870	911	2101	455

* Provisional data

Source: The Health Protection Agency Laboratory Reports (LabBase2)

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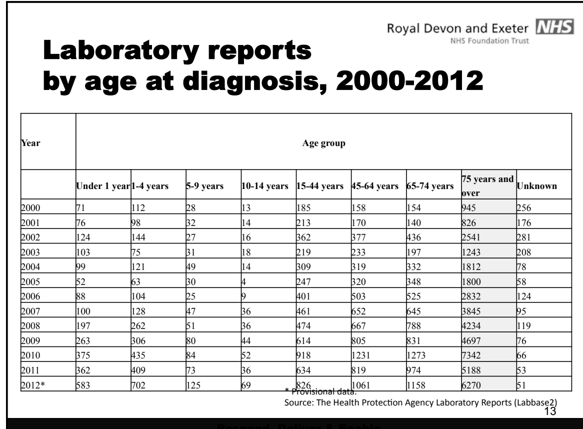
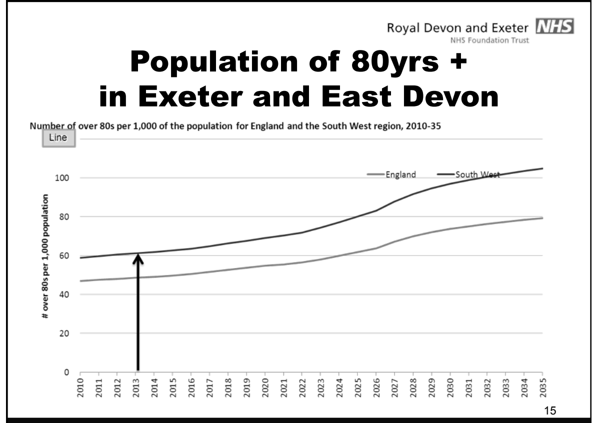
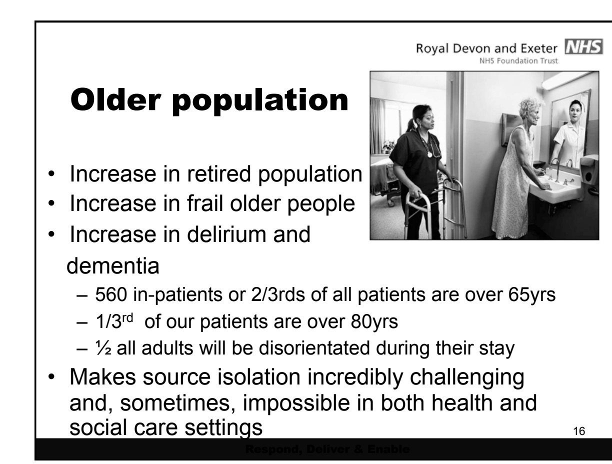


Year	Age group								
	Under 1 year	1-4 years	5-9 years	10-14 years	15-44 years	45-64 years	65-74 years	75 years and over	Unknown
2000	71	112	28	13	185	158	154	945	256
2001	76	98	32	14	213	170	140	826	176
2002	124	144	27	16	362	377	436	2541	281
2003	103	75	31	18	219	233	197	1243	208
2004	99	121	49	14	309	319	332	1812	78
2005	52	63	30	4	247	320	348	1800	58
2006	88	104	25	9	401	503	525	2832	124
2007	100	128	47	36	461	652	645	3845	95
2008	197	262	51	36	474	667	788	4234	119
2009	263	306	80	44	614	805	831	4697	76
2010	375	435	84	52	918	1231	1273	7342	66
2011	362	409	73	36	634	819	974	5188	53
2012*	583	702	125	69	826	1061	1158	6270	51





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Does Norovirus infection matter?

After all, it's 'mild, self limiting illness'

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Norovirus is a mild, self limiting illness?

- Severe outcomes are highlighted by Desai et al (2012) in relation to Genogroup 2 Genotype 4
- Local experience:
  - Duration of symptoms in hospital - mean 5 days
  - Extended LOS
  - Dehydration > rehydration > 'relapse' about 3 days post-resolution
- Some examples of impact on elderly service users:
  - Perforated oesophagus – ITU 2 weeks
  - Bleeding oesophageal varices
  - +++ Haemetemesis
  - Aspiration pneumonia
  - #NOF

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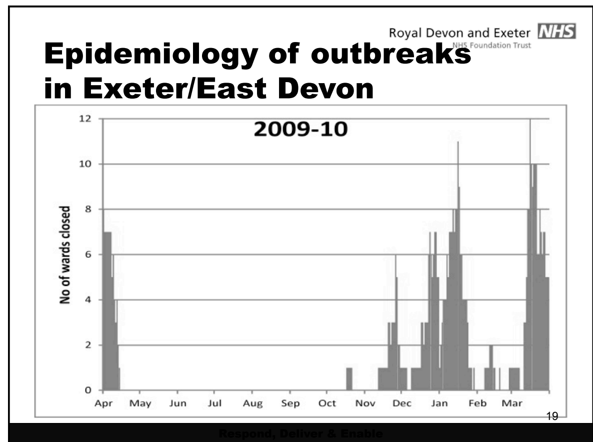

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Impact/Lost Opportunies

- 2350 bed days lost over 5 months
- 740 elective patients cases cancelled on the day of admission
- Length of stay increased, particularly if patients were due for transfer to other institutions such as care homes or community hospitals when discharge was usually delayed until the ward reopened.
  - Reluctance from social care to even visit to assess patients on an affected ward

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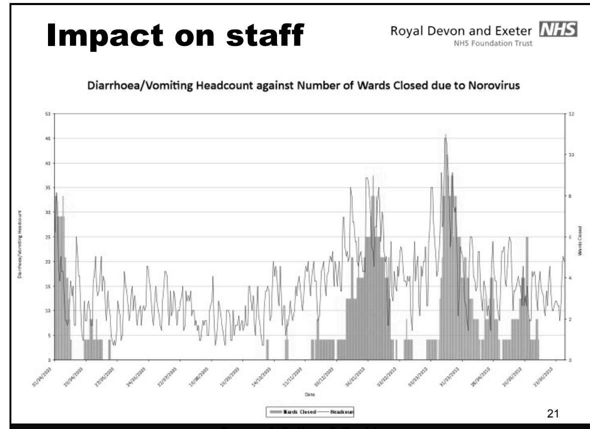

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Preparation for winter 2010-11

- HPU to provided 'early warning data'
- All ward and dept matrons received a written update
- Power point presentation sent to all Lead Nurses for cascade to clinical teams
- Additional updates provided for link nurses
- Additional updates provided for medical staff
- Business case for 'outbreak' scrubs approved and scrubs purchased
- Additional cleaning services planned for affected wards
- Outbreak resources on intranet updated
- Cross template working reviewed and plans put in place for 'lock down' if one ward affected on a template.

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Patient and Staff Movement

- Cleaning staff - strictly allocated to closed ward only
- Doctors and AHPs - visit closed ward last or specific staff designated to work in affected areas
- Single bay closure - where possible, nurses allocated to that bay only.
- No discharges to care homes/community hospitals from affected bays/wards unless patient has had and recovered from NV infection. Even this is undertaken with discussion between infection control team and receiving area.
- Movement of patients from ward to ward to cohort is avoided unless capacity for emergency admissions is threatened - last resort.
- Symptomatic staff advised to remain absent until symptom free for at least 48 hours.

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Reopening affected wards

- Decision to re-open made by IPCT/DIPC only
- Reopened 72 hours after cessation of uncontained symptoms (contained=isolated in side room)
- Specialist cleaning team given 24 hours notice of need for terminal clean wherever possible
- Terminal clean usually completed within 1 working day
- Chlorine releasing agent used as per national guidelines
- H_20_2 vapour used if *C.difficile* also a factor.

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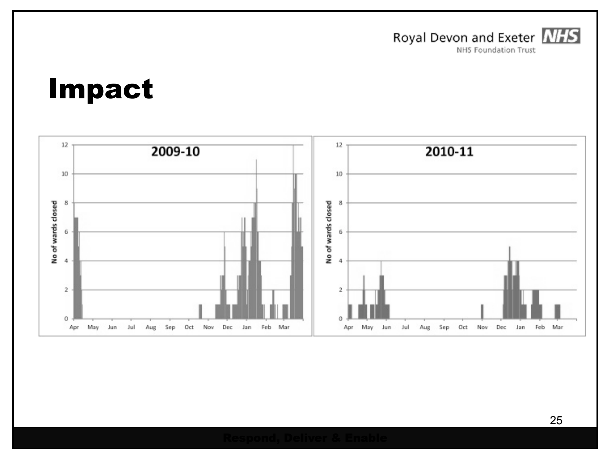
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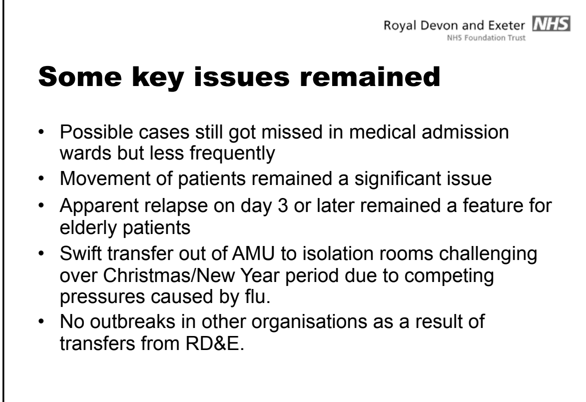
Impact
2009-10
2010-11
No of wards closed
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
25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Some key issues remained
• Possible cases still got missed in medical admission wards but less frequently
• Movement of patients remained a significant issue
• Apparent relapse on day 3 or later remained a feature for elderly patients
• Swift transfer out of AMU to isolation rooms challenging over Christmas/New Year period due to competing pressures caused by flu.
• No outbreaks in other organisations as a result of transfers from RD&E.
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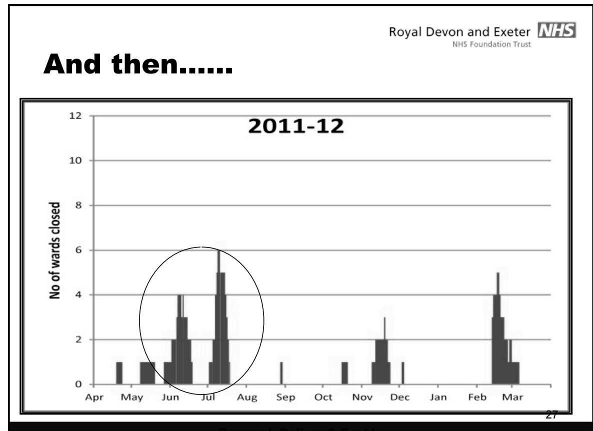
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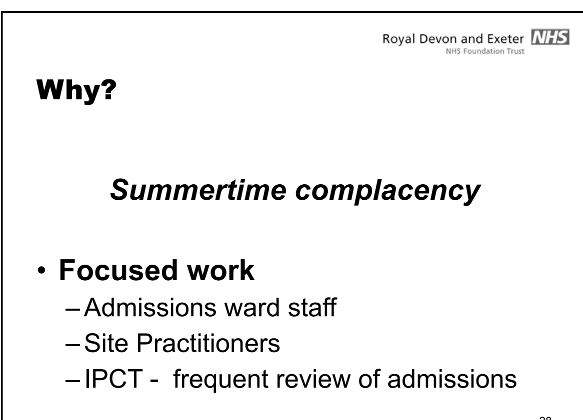
And then……
2011-12
No of wards closed
0
2
4
6
8
10
12
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
27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Why?
Summertime complacency
• Focused work
– Admissions ward staff
– Site Practitioners
– IPCT - frequent review of admissions
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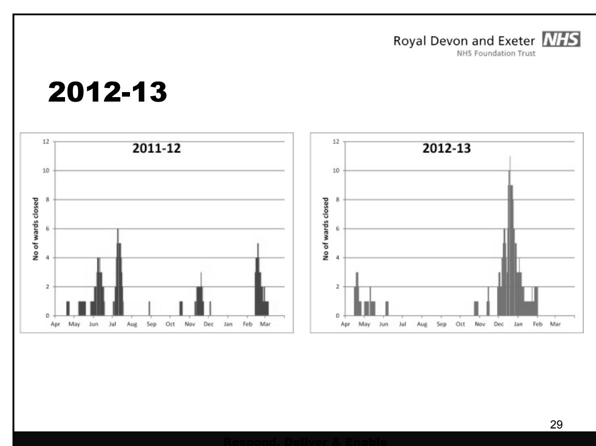
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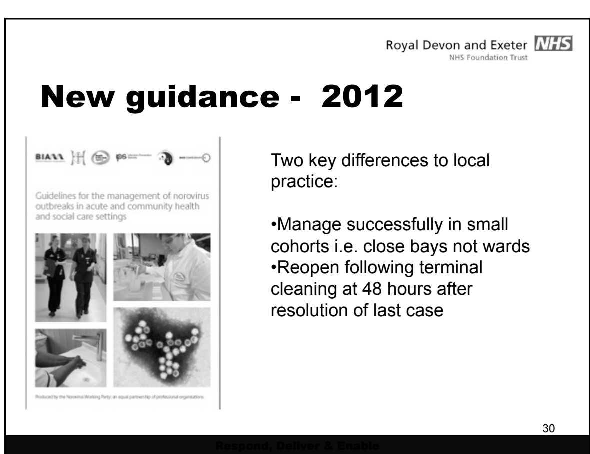
2012-13
2011-12
2012-13
No of wards closed
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
29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New guidance - 2012
Guidelines for the management of norovirus outbreaks in acute and community health and social care settings
Two key differences to local practice:
•Manage successfully in small cohorts i.e. close bays not wards
•Reopen following terminal cleaning at 48 hours after resolution of last case
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Local practice regarding extent and duration of closure

- An early whole ward closure approach is taken for any ward where either:
  - the source can not be clearly identified at the outset and therefore it is unknown how many other patients might have been exposed, OR
  - there is more than one case already at the time of reporting, OR
  - the first patient identified is confused and has wandered around the ward and might have exposed other patients outside their bay, OR
  - the first patient had been sharing toilet facilities with patients from other bays.
- Duration of closure - until 72 hours after resolution (or containment) of last case

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Local experience - winter 2012

- 14 of the 26 outbreaks resulted in full ward closure at the onset,
  – 5 of the 26 wards only one bay was closed initially but spread to other bays resulted in subsequent full ward closure.
  – Full ward closure at outset resulted in shorter duration of closure = 2.1 days less
- 7 outbreaks confined to one bay only
  – cohort nursing was able to be implemented - 24 hours
  – transfers out of the whole ward were restricted

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Impact

- 285 symptomatic patients
- 1036 lost bed days
- So was this failure?
  – No spread from medical wards to surgery
  – No elective activity cancelled as a result of norovirus outbreaks
  – No known spread to care homes

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Conclusion

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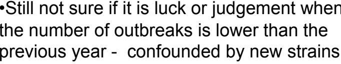
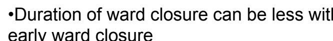

•Without a norovirus vaccine, and with an increasing elderly population, norovirus outbreaks will continue be a challenge

•Still not sure if it is luck or judgement when the number of outbreaks is lower than the previous year - confounded by new strains

•Duration of ward closure can be less with early ward closure

•It is possible to implement ward closure whilst minimising impact on 'business as usual'

•Not all national guidance is helpful - have to consider local experience/population

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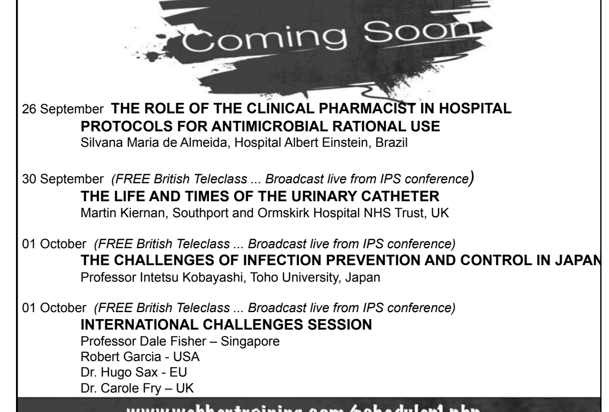

26 September **THE ROLE OF THE CLINICAL PHARMACIST IN HOSPITAL PROTOCOLS FOR ANTIMICROBIAL RATIONAL USE**
Silvana Maria de Almeida, Hospital Albert Einstein, Brazil

30 September *(FREE British Teleclass ... Broadcast live from IPS conference)*
THE LIFE AND TIMES OF THE URINARY CATHETER
Martin Kiernan, Southport and Ormskirk Hospital NHS Trust, UK

01 October *(FREE British Teleclass ... Broadcast live from IPS conference)*
THE CHALLENGES OF INFECTION PREVENTION AND CONTROL IN JAPAN
Professor Intetsu Kobayashi, Toho University, Japan

01 October *(FREE British Teleclass ... Broadcast live from IPS conference)*
INTERNATIONAL CHALLENGES SESSION
Professor Dale Fisher – Singapore
Robert Garcia - USA
Dr. Hugo Sax - EU
Dr. Carole Fry – UK

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